

SFI METAL PRODUCTION

Newsletter No 1/21

Spring has arrived, also to Trondheim, even though snow showers are still visible in the hills surrounding the city. However, we are all optimistic and looking forward to more sunny days and a normal way of life when it comes to the Corona virus.

The last year has been a challenging and difficult time for the SFI Metal Production and the partners. We have had to deal with challenging situations to maintain a safe work environment within changing regulations and advises. For the SFI, home offices and digital meetings have been the everyday life. Two Spring Meetings (2020 and 2021) and the Autumn meeting (2020) have all been digital events. However, there are also a positive side, more participants are attending the digital meetings than the physical. So, for future events, we will make digital participation possible also when we go back to normal life.

I would like to use this opportunity to thank all presenters and participants at the Spring meeting 2021. I am impressed by the quality and results of the work presented at the meeting from both industry and research partners.

If you want to learn more about our activities, please read our Annual Report 2020 on our homepage.

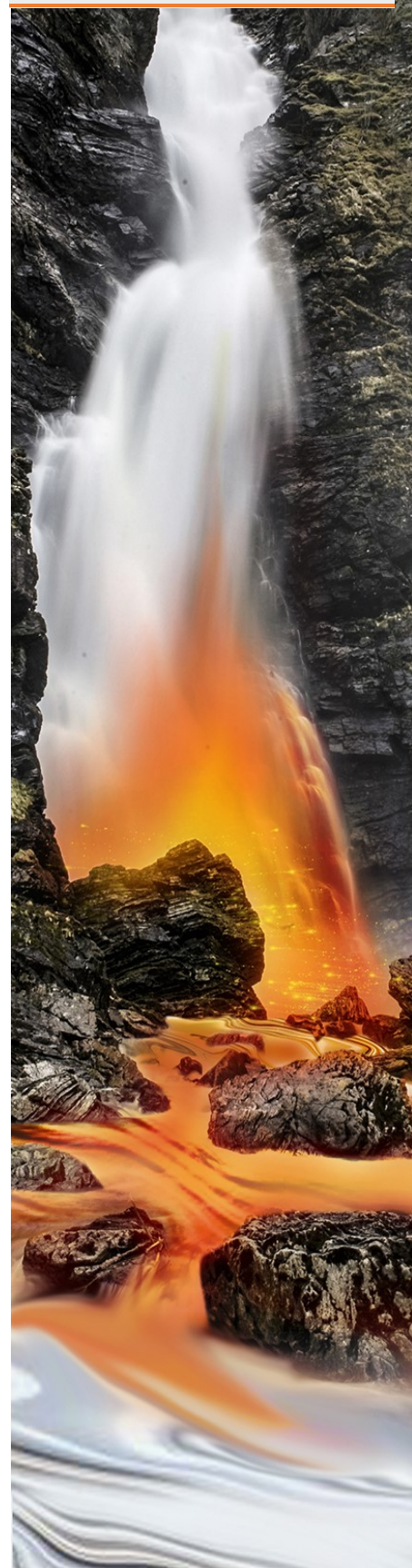


Aud N. Wærnes,
Centre Manager



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SFI CONTINUATION STRATEGY AFTER 2023

The SFI centre funding period is coming to an end in the beginning of 2023. It is important to start the in-depth discussions on how to ensure that the good results and strong research activities are maintained and prolonged. Our ambition is to develop a new SFI project based on the strong fundament of SFI Metal Production. We plan to apply for a new funding period, but we also want to ensure that there is no interruption in the activity between the termination of the existing centre and a possible new one. This important topic has been on the agenda on several occasions lately:

Seminar for the SFI Management Team on «Continuation Strategy»

March 2nd we organized a strategy seminar for the management team. Some of the SFI industry partners were invited to give an overall perspective on: What are the main challenges facing the metal production industry in the years to come? And what are the associated knowledge needs? The answers to these questions will be crucial for the outline of a new SFI project.

It is of great importance to consider our relation to other centres and ongoing large-scale activities. A new SFI project must be unique and at the same time bridge gaps where needed. To give input in this discussion we invited Professor Knut Marthinsen who is centre manager at SFI PhysMet, a newly started SFI at Faculty of Natural Sciences at NTNU.

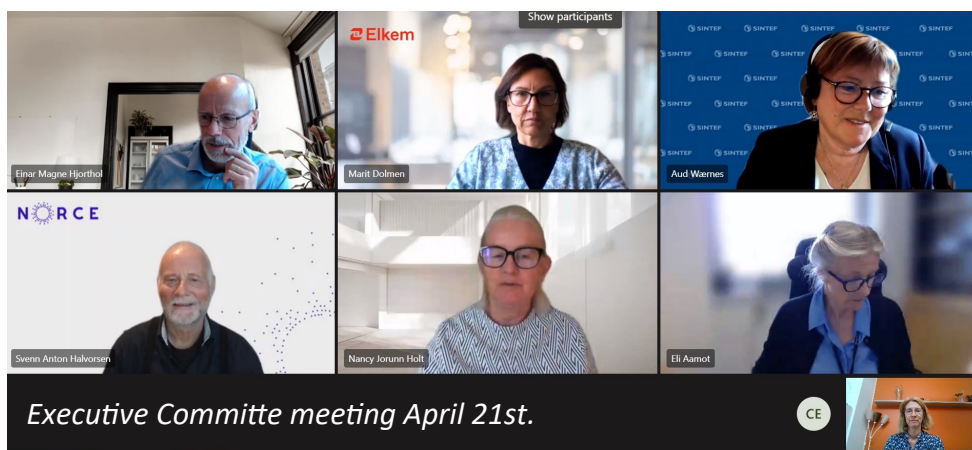


SFI Metal Production management team at strategy seminar March 2, 2021. Photo: Kari Håland

«Continuation strategy» was on the Spring Meeting and the Executive Committee meeting agenda

The conclusions and questions raised at the strategy seminar were further discussed at the SFI Spring meeting and the Executive Committee (EC) meeting April 20th and 21st.

Since the start of the centre in 2015, we have learned a lot on how to organise and operate a Centre. How can we maintain our ambitions on developing a new SFI project, and maintain a collaborative platform for metal-producing industry, academia and research institutes in Norway? At the Spring meeting and the EC meeting we discussed possibilities to establish a forum /cluster, which can serve as an umbrella organization for future activities. Five existing clusters and comparable centers were invited to share their experiences. REGAL, SAIMM, Eyde Cluster and Arctic Cluster Team gave





inspiring presentations on how they have organised their activities, and their input is highly appreciated.

Input from the Spring meeting and the SFI Executive Committee will be incorporated in the further continuation planning.



SFI SPRING MEETING—April 20-21

The SFI Metal Production Spring Meeting was organized as a webinar April 20-21. In addition to the topic «Continuation Strategy», important results and ongoing activities from all research domains were presented and discussed. Day 1 was opened by key note speaker Gunnar Grini from Norsk Industri who talked about NHO's work on increased utilization of industrial waste and by-products. Day 2 was dedicated to two main topics: *Dust—Generation and Measurements* and *Waste—mapping and valorisation*.


We would like to thank all speakers and the audience for making this an interesting and successful meeting. Below are pictures from some of the presentations at the digital meeting.

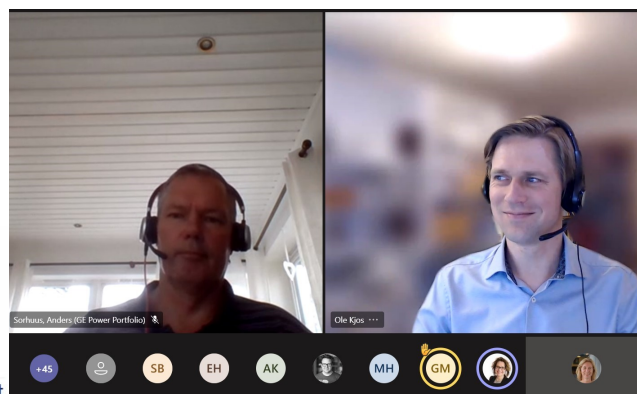


- Advanced Gas Treatment in Aluminium Electrolysis
 - IPN owned by GE Norway
 - Alcoa Norway / Mosjøen is partner
 - SINTEF will provide contract research and project management
 - GE's PIA (Pot Integrated Abart) technology
- The primary objective is to develop and demonstrate a step change in off-gas treatment by introducing the PIA concept and offer new knowledge regarding stabilization of the electrolysis cell and efficient gas treatment.




Technology for a better society





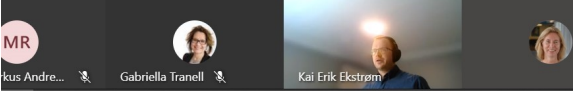
Above: Ole Kjos, SINTEF and Anders Sørhuus, GE Power presented the AGATE-project: Advanced Gas Treatment in Aluminium Electrolysis - A spin-off IPN project at Test center Mosjøen, Alcoa

Right; Kai Erik Ekstrøm from NOAH gave a presentation on fly ash from municipal waste incineration.

**NOAH**

Fly ash from municipal waste incineration
Generation and Treatment

SFI Metal Production spring meeting 2021
Kai Erik Ekstrøm, NOAH AS



Below: Activities on dust mitigation and measurements at Elkem were presented by Ragnhild Jensen and Jens Christian Fjellidal, Elkem. Their talk was followed by an interesting discussion with input from among others Jean Pierre Birat, member of SFI Metal Production Scientific Committee.







Elkem activities on dust mitigation and measurements

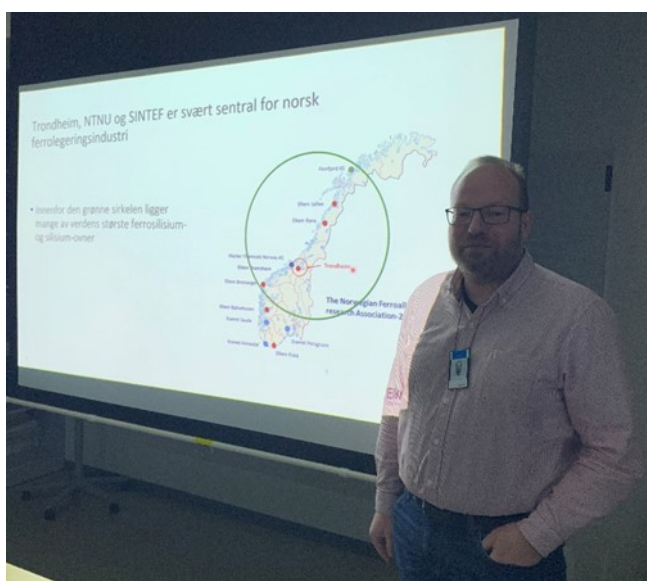
Ragnhild Jensen and Jens Christian Fjellidal
21 April 2021

MINNEORD EDIN MYRHAUG

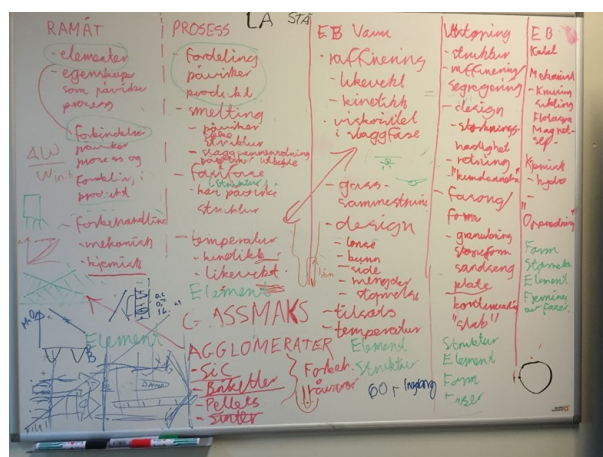
Det var med stor sorg vi mottok budskapet om Edin Myrhaugs bortgang. Edin har vært en god kollega og samarbeidspartner til norske Mn- og Si-produsenter og NTNU/SINTEF. Han var en av pådriverne til SFI Metal Production og var aktiv i både forarbeidet og oppstarten av senteret.

En av fanesakene til Edin var allerede fra oppstarten av senteret, at eksperimentelle resultater skulle modelleres eller matematiseres, slik at både kvaliteten og tilgjengeligheten av resultatene ble bedre. Dette har vært et fokus i SFI Metal Production, og har også ført til en tilsvarende standard i tilhørende prosjekter.

Edin har også vært en aktiv samarbeidspartner og definert innhold og fokus innenfor Si/FeSi området i senteret. Han var alltid tilgjengelig for en diskusjon og var en god diskusjonspartner/ressurs i senteret. Edin var svært kunnskapsrik og allsidig, og hadde samtidig respekt for diskusjonspartnerne uansett om det var førsteårsstudenter eller erfarne forskere. Dette førte til et godt arbeidsmiljø og god styring på prosjektene. Edin var en god venn, en god samarbeidspartner og et godt menneske som vil bli dypt savnet.



Edin ga ofte uttrykk for merverdien samarbeidet mellom NTNU/SINTEF og industrien hadde gitt partnerne i SFI Metal Production.



Edin var kunnskapsrik og hadde mye han skulle si under en diskusjon. Et eksempel er denne tavlen etter et uformelt morgenmøte med Eli Ringdalen.

På vegne av SFI Metal Production

Merete Tangstad

SFI PhD dissertations in 2021

Several of the PhD candidates at the SFI are going to complete their doctoral degree by the end of 2021. Five dissertations are planned from May to September 2021. In addition, Attila Kovacs, our PhD candidate working at Oxford University, completed his Doctor of Philosophy Degree in March 2021.

Congratulations Dr. Kovacs

Attila Kovacs has successfully defended his thesis for Doctor of Philosophy at Oxford University. Attila has been working on fundamental mathematical modelling of alumina dissolution. Highlights from his work involve the identification of characteristic time scales for the freezing-melting-dissolution process as well as determining under which conditions alumina rafts may form.

The supervision of Attila has been a successful joint venture between scholars at Oxford and NTNU as well as key researchers in Hydro and NORCE.



Coming PhD dissertations

May 26: Daniel Clos, PhD Candidate in Research Domain 4 *Emissions and Energy Recovery*



June: Massoud Hassanabadi, PhD candidate in Research Domain 3 *Recycling and Refining*



August 18: Erlend Lunnan Bjørnstad, PhD candidate in Research Domain 3 *Recycling and Refining*



August: Håkon Myklebust, PhD candidate in Research Domain 4 *Emissions and Energy Recovery*



Autumn 2021: Romain Billy, PhD candidate in Research Domain 5 *Materials and Society*



High participation from SFI Metal Production at 11th International Conference on Molten Slags, Fluxes and Salts

The MOLTEN 2021 Conference was organized in Korea February 21-25, as a virtual event. This conference brings together academic environments that is working with various processes but has still some fundamental challenges. The participation from NTNU and SINTEF was high with 15 presentations, where some were originating from the SFI Metal production centre and some were from associated projects.

Molten Slags Fluxes and Salts is an international conference that is organized every third year. All presentations were recorded and made available at the virtual conference platform. Typical conference papers were not admitted, only extended abstracts. Most of the presentations were however asked to publish a paper in a journal, and many will during this spring be published in e.g. Metallurgical and Mineral Transaction B.

The digital concept was working well. At the conference, every speaker got 5 minutes, and after a group had presented a discussion was initiated. One could also chat with other participants during the sessions. By being active one could still chat with old acquaintances and also discuss with new colleagues. Maybe not to the same extent as other conferences, however still be able to network!

Vincent Canaguier received MOLTEN 2021 Most Viewed Presentation award!

Several SFI Metal Production members contributed with presentations at the conference. SINTEF researcher Vincent Canaguier's presentation turned out to be one of the top 5 most viewed presentations! The title of his presentation was Foaming during silicomanganese reduction.

The organizer writes that Vincent's enthusiastic presentation helped to make the event a great success! A prize (USD 100) will be transferred to the winner.



Important events coming up

January-June, 2021 SFI Metal Production Webinar series. 45-minutes presentations on the topics Silicon, Manganese and Aluminium. Every second week.

May 26, 2021 PhD defense for SFI Metal Production PhD candidate Daniel Clos. More information and link to the online defence will be available at our website.

May 27, 2021 Webinar on scaling in aluminium industry heat recovery Workshop organized by SFI Metal Production and FME HighEff.

June, 2021 PhD defense for SFI Metal Production PhD candidate Massoud Hassanabadi. More information and link to the online defence will be available at our website.

August 18, 2021 PhD defense for SFI Metal Production PhD candidate Erlend Lunnan Bjørnstad. More information and link to the online defence will be available at our website.

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Autumn 2021 PhD defense for SFI Metal Production PhD candidate Romain Billy. More information and link to the online defence will be available at our website.

September 26-29, 2021 INFACON XVI Conference, Trondheim/online.



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