



newsletter

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EDITORIAL: NEWS FROM BRUSSELS

RFCS workshop. In the last Support Group, we decided to organize every year a dissemination workshop on projects of ESTEP members. This year European Commission took the initiative and a workshop will be organized on February 2nd. ESTEP will have three speaking slots, one on ESTEP and two clusters of 90 minutes each. The registration is open now.

The RFCS is an important funding instrument for the European steel community and its value chain.

In 2015 ESTEP took the initiative to work on **RFCS priorities**, which provide (if applicable) one extra point at evaluation stage. In a broad and open approach ESTEP's Strategic Research Agenda was analyzed by ESTEP's working groups enlarged by volunteering steel experts to identify gaps, which ought to be tackled by dedicated research projects.

Not only due to SPIRE the European steel community of ESTEP is considerably contributing to various initiatives and programs of Horizon 2020. In order to be more efficient in answering H2020-calls, ESTEP decided to nominate experts, each of them dedicated to one of the steel relevant H2020 opportunities (SPIRE, EMIRI, FoF, E2B, EGVI, KIC Raw Materials, EUREKA-Metallurgy Europe). These experts are called **Programme officers (PO)**.

In the last quarter of 2015 the European Commission formally launched the **High Level Group of Energy Intensive Industries (HLG EII)**. The former HLG of steel does not meet anymore. The idea is to include its issues into the HLG EII. ESTEP as well as EUROFER successfully applied to become member of the new HLG. The first meeting was on December 18th dealing with funding opportunities, innovation, trade policy, and circular economy.

Klaus Peters

ULCOS STEERING COMMITTEE

An ULCOS Steering Committee was held in the premises of ESTEP on the 2nd of December 2015. Representatives from ArcelorMittal, ThyssenKrupp Steel Europe, Tata Steel, voestalpine, Dillinger Hüttenwerke/Saarstahl, SSAB (now also including the former ULCOS partner Ruukki) and LKAB have all gathered in Brussels.

The first topic on the agenda was the discussion on the running projects on ULCOS-BF, Hlsarna and Electrolysis (ULCOWIN and ULCOLYSIS).

For the time being, the preparation of the next Hlsarna campaign concentrates much attention and requires significant work. The engineering of the necessary pilot plant modifications is under way at Tata Steel. These modifications mainly concern plant auxiliaries: facilities for raw materials preparation, pneumatic injection, off-gas collection and de-dusting. This campaign is willing to demonstrate on the long run (several months) the operability, flexibility, economy and CO₂ performances of the process; it is financed by the industrial partners with support from the EU through the H202-SILC II call. In order to allow making this campaign 3 months longer (and thus much more significant from an industrial perspective), the partners have recently filed an additional RFCS application.

The scale-up of the ULCOS electrolysis processes is also actively pursued. A pilot/demonstration project is under preparation for ULCOWIN, the low temperature alkaline electro winning process, and will probably be filed in the frame of the EU H2020-SPIRE 2017 call.

Steering Committee members have also exchanged on energy and CO₂-related projects currently running in the various ULCOS companies.

An impressive overview of the new direct reduction plant under construction in Corpus Christi (Texas, USA) was given by voestalpine. Apart from its 140 m-high reduction and briquetting tower, it integrates many state-of-the-art environmental options, such as a completely covered iron ore storage area.

Some projects aiming at producing and utilizing renewable energies have also been discussed, such as the 22 MW solar project of Tata Steel in Ijmuiden (NL).

Last but not least, other projects related to the transformation of CO₂ and other steel plant gases into valuable products were also discussed, including the Steelanol project involving ArcelorMittal, Lanzatech and Primetals in Ghent (Belgium) and the Carbon2Chem project bridging the steel industry (represented by ThyssenKrupp Steel in Germany) and the chemical industry. The need of state-aid mechanisms for sparking the development of these processes was unanimously acknowledged by the partners.

During this meeting, a re-focus of the ULCOS programme was also initiated to integrate shorter-term CO₂ mitigation

options. Connections and possible exchanges with some of the ESTEP working groups were discussed with the new Secretary General of ESTEP, Klaus Peters.

Jean Borlée

WG PROFIT



This working group of ESTEP gathers various stakeholders of the Steel business: steel companies, equipment builders, research organizations, representatives of national platform, etc.

The main scope of the working group are the new process technologies and manufacturing routes that provide a positive impact on the production costs, the productivity and notably the final product quality.

The year 2015 has been characterized by the renewal of several members and the launching of a large discussion on how to re-align the role and mission of the group in regards of the evolution of the World economy and the initiatives recently introduced in Europe by the Commission such as the program dedicated to the PPPs (Private Public Partnership) among which SPIRE is a relevant example.

During the second part of the year, two meetings have been dedicated to review the topics of the 2013 Strategic Research Agenda (SRA) and their implementation. The effort has been concentrated on the item "Safe, cost-effective & lower capital intensive technologies", more directly in line with the field of expertise of the group. This exercise will need several meetings before a new action plan will be defined.

Part of the discussions have been dedicated to the identification and selection of new annual priorities for the RFCS program (from 2016 onwards), resulting from the SRA and focused on the following items: resource and energy efficiency, promotion of flexible and multifunction production chain.

C. Marique

WG-I2M: INTEGRATED INTELLIGENT MANUFACTURING



The second half of 2015 was defined by three main activities of the working group: the preparation of common RFCS proposals, the proposal for a new RFCS priority for the next year and a regular meeting on the 1st of October in Brussels.

RFCS proposals: As announced in the last newsletter the working group I2M set up a

flagship proposal for the RFCS programme ("Boosting the global and integrated use of huge volume of data gathered around steel manufacturing to solve open technical issues by means of Big Data Techniques") in the field of "Integrated Intelligent Manufacturing" with eight partners from which six are active in our working group. The addressed topic is one of the mega trends in the European industry at the moment and its importance and suitability for steel industry shall be deeply investigated. The group identified furthermore eight additional proposals coming from several organizations which fulfill the definition of I2M.

RFCS priority: Starting with a telephone conference on the 31st of August a strong and very active discussion started in order to prepare a new suggestion for a possible priority for the RFCS research programme for the next year. Hereby the group started with several ideas strongly linked to the

Strategic Research Agenda. Eventually one topic was selected. Furthermore a suggestion regarding the wording of this possible priority plus an additional explanatory text and a description of the relation of this idea to the SRA of ESTEP have been generated and transferred to the Support Group for further discussion.

Regular meeting: the main item of the meeting held on the 1st of October was the further developments of the work conducted for the I2M/"Industry 4.0" roadmap. The outcome of the different tasks distributed at the previous meeting were presented and discussed. Furthermore the general structure of the roadmap had been finally fixed and the existing contributions were now integrated. The next necessary steps were identified and assigned to members of the working group. Additionally there was a review of the research calls 2016 and 2017 of the Horizon2020 programme and a discussion about possible submissions of proposals in the relevant calls.

Last but not least, it was discussed in the group the initiative of Steel Times International to organize a conference on "Industry 4.0" in autumn next year.

H. Peters

WG TRANSPORT



Following the departure of Mr. Hoffmann from ESTEP, I started this year to serve ESTEP as the new chairman of the Work Group Transport. This year, we also received 3 new members into our group. Now we have 15 members from 8 different countries with regularly 10 members participating in our meetings.

This year, two regular WG meetings had taken place in May and December respectively. In between, there were also 2 web conferences, in which we worked on the 2 main topics as mentioned below.

The main topic of our first meeting was the Horizon 2020 call for affordable weight reduction of high-volume vehicles and components taking into account the entire life-cycle with a funding of 8 Million euros for each project. This was later published by the European Commission in October this year. Collaborating with the European car-makers within the European Council for Automotive R&D (EUCAR), members of our Working Group are now participating in the project proposal adhered to this call. We are looking forward to the involvement of steel sector in the transport-related R&D projects in EU! Once approved, the projects will start in the end of 2016 and last until 2019.

In our second regular meeting, we set our focus on finalizing our proposal to the RFCS Priority 2016. Nine members have actively contributed their inputs prior to this meeting. We arrived at the final wordings as: Cost effective lightweight steel solutions for new vehicle concepts or components

with improved LCA or safety performance. Note that this draft has a strong link to the ESTEP Strategic Research Agenda, as required by the ESTEP committee. In addition, we also provided two other suggestions that focus at the development of new steel grades and new manufacturing processes respectively. All three proposals had been submitted to the ESTEP Secretary General for selection and further approval.

Last but not least, I thank all the members for your support and I wish you a very pleasant holiday and happy new year

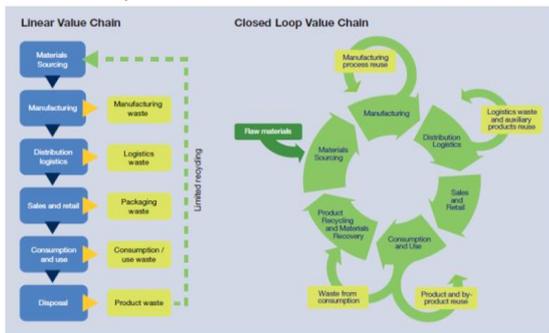
Jia-Uei Chan

WG PLANET



In the second semester of 2015, the working group organized a telephone conference the 25th of September and the 13th of November. The participation remains constant (11-13 people).

The September meeting was focused on the presentation of new structure of ESTEP by Klaus Peters and the review of the work carried out by the task force on Biodiversity, led by Valentina Colla of Scuola Superiore Sant'Anna. The decision taken was to summarize the document in a position paper suitable for different audience, abandoning the idea of a general European roadmap.



Circular Economy is defined as sources of future economic growth where more products are made out of secondary raw materials, waste is considered a valuable resource, and where innovative business models retain physical goods longer and more efficiently in productive use

http://ec.europa.eu/smart-regulation/impact/planned_ia/docs/2015_env_065_env+_032_circular_eco_nomy_en.pdf

In November the meeting addressed the issue of the RFCS priorities and, in particular, the review of 2.4 that was assigned at WG4. The different proposals were prioritized and sent for the discussion to ESTEP. Moreover WG4 started the review of the SRA by reviewing the main topic related to Sustainable Steel Production in relation to the EU institutions' new focus on the circular economy.

The cross WGs task force, proposed by WG4 at the last Support Group, for setting-up a road map regarding how steel could contribute to sustainable production in all sectors of the economy started under the leadership of Louise Brimacombe.

The next meeting will be a face to face meeting and held at the end of January (tentative date 26th)

E. Malfa

WG PEOPLE



Social Innovation:

The WG worked on five key questions that should help to identify social innovation approaches and aspects in technical research projects for the other working groups.

A two pages questionnaire is under progress. It will help to identify social innovation and people topics in technical research projects, including the degree of importance and relevance.

Lastly an overview should be created. This should show and integrate people themes to be integrated in Horizon 2020

and SPIRE. The objective is to facilitate and assist people in charge for the human impact topic.

Knowledge Management:

For the European Steel Industry, Knowledge and Know-How became a crucial factor of success. The WG5 is already working on a common understanding of "What is Knowledge Management about?" and an exchange of the related practices in the steel companies.

For that reason, a one day workshop will take place, to discuss the issue more in detail. This workshop is planned in Brussels in January 2016.

GREEN STAR / GT-VET:

The GREEN STAR project is finalized since October 2015. The final conference took place at a bioplastic company (API) in the Veneto Region. The GT-VET modules Energy and Waste were adopted as a blueprint and modified, Lifecycle Assessment was developed as a new training sub-module for the automotive suppliers industry.

Other Activities:

The 19th European Steelmaster 2015 took place in October and November 2015 in Dalmine and San Gemini (Italy), supported by ESTEP and WG5 members.

WG5 is participating in the EUROFER Task Force Sustainability developing "The European Steel Industry Vision" looking at Steel as a backbone of sustainability in Europe.

V. Echterhoff

WG ENERGY

During the second semester 2015 the working group



continued to strongly support the European Commission (EC) public-private-partnerships(PPP) initiatives dealing with the group thematic topics such as Sustainable Process Industry Resource Efficiency (SPIRE - Applications) and Energy Materials Industrial Research

Initiative (EMIRI).

Various initiatives on more specific energy topics were also carried out. Various initiatives have been held for instance on "Future trends on steel for wind applications". In addition a consistent participation of members to activities in the EERA frame especially for nuclear topics has been recorded. For the coming months additional workshops on renewable and power generation are under preparation.

Regarding the funding, some projects in the H2020 frame are just to be signed by the EC. Furthermore a wide spread participation of the WG6 members on H2020 proposals has also been recorded.

Concerning the proposals presented in the RFCS frame has to be highlighted an increase in that number in 2015. The interest of energy steel products and applications is continuously growing and currently the preparation of new proposals is ongoing.

Furthermore in the second part of the year various initiatives, events and actions on Horizon 2020, the R&I Programme of the European Commission that will last from 2014 up to 2020, have been carried out. Among them, representatives of the WG participated to various Brokerage Events regarding SPIRE (Applications) and for EMIRI held in Brussels.

All those initiatives on energy themes put once more the activities of the WG on the wave top in the EU research and innovation activities!

Date and location of next meeting:

-Middle March 2015 - Brussels.

P. Gimondo

OXY RICH Project



An European project financed by the EC has been performed with the aim of reducing CO₂ emissions in the steel sector. The project: **Oxygen Enrichment of Air Combustion for natural Gas**

Furnaces in Re-Heating Furnace of the Rolling Mills (January 2014-June 2015) has been performed among ArcelorMittal (Olaberria facility, Spain) as leader of the project, Tecnalía (Spanish RTD) and Sysadvance, manufacturer of in situ oxygen suppliers, from Portugal.

The main objectives of the project are to reduce the natural gas consumption and the CO₂ produced in the reheating



furnace before the Rolling Mill process by **using enriched air** in the natural gas burners. **Less nitrogen** that enters into the furnace means less heat losses and **natural gas savings**. The percentage of Oxygen in combustion air

has arrived up to 25%. Oxygen injection can be replicated the oxygen injection in other sectors different from the steel sector: ceramic, bricks, cement, heating of steel parts before the forging process, thermal treatment of steel parts, Aluminium foundries, etc.

Semi-product after heating in the re-heating furnace

Re-heating furnace where oxygen injection trials have been performed

Steel semi-product once heated



The main results obtained using oxygen in the re-heating furnace are:

- **Savings of about 6.5% in natural gas and 5% reduction of CO₂ emissions** have been obtained at working conditions
- Cost of investment for 1,200 Nm³/h in situ O₂ equipment: 1.6 M€ about 4 years pay-back time at studied conditions
- Annual maintenance costs: 3% investment cost
- Energy costs: 0.59 kWh/Nm³ pure O₂
- **An excel tool has been developed to estimate savings** injecting oxygen according to steel production, natural gas price, oxygen supplier price or in situ produced oxygen. The excel tool is available at the project web site.
- Injecting oxygen is technically and economically feasible.

As disadvantages of using oxygen the **Resilience test** performed to the final product showed lower values working at O₂ concentration higher than 24% and an **increase of NO_x**: NO_x (154 mgNO_x/Nm³ with no O₂ – 267 mgNO_x/Nm³ with O₂) has been produced. Values under local allowed limit: 400 mgNO_x/Nm³

PROJECT WEBSITE: www.oxyrich.eu

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OXY-RICH - SILC 67/G/ENT/CIP/13/D/N03S02 - SI2.666081

FORTHCOMING EVENTS

ESTEP WG Chairs meeting	Brussels 1/02/2016
RFCS workshop	Brussels 2/02/2016
ESTEP Support Group	Brussels 16/02/2016
A.SPIRE Working Groups and community day	Brussels 18/02/2016
European Steel Day	Brussels 21/04/2016
SAM 10 Seminar	Rome, 9-10/5/2016

The ESTEP Newsletter is issued on a regular basis by the ESTEP Secretariat to the ESTEP members. The editorial panel consists of K. Peters, R. Di Santo and W. Moonen.

Contributions for the newsletter can be sent to the ESTEP secretariat.

C/o EUROFER
Av. De Cortenbergh 172,
B-1000 Brussels
Tel +32 2 738 79 43
Fax: + 32 2 738 79 56
Email: secretariat@steelresearch-ESTEP.eu