

The Focus Group
“Low Carbon and Energy
Efficiency” of ESTEP
is pleased to present
the webinar & workshop



WASTE HEAT

RECOVERY & UTILIZATION

FOR STEEL PLANTS

Overview, state of the art, advanced options
and future developments

MAY 4, 11, 18
JUNE 1, 2021 &



BACKGROUND

Waste heat recovery and utilization will become a cornerstone for future energy efficient steelmaking, especially since energy efficiency is key to further minimize carbon dioxide emissions and save primary resources.

Within a steel plant there are different waste heat sources available, for example but not limited to:

- Hot off-gases
- Cooling water
- Hot intermediate products like slabs, billets, etc.
- Hot slags

Currently most of these sources are not utilized for waste heat recovery. Besides the technical challenges of the waste heat recovery itself, waste heat utilization (e. g. electric power generation) and market regulations related to this topic have major impact on the feasibility of such projects.

Currently waste heat recovery systems are partially installed at some selected plants (already high TRL), but the majority of plants are not equipped with such solutions. Hence, a comprehensive work is necessary to improve this situation.

THE AIMS

The three-sessions webinar and one interactive workshop is dedicated to key players dealing with waste heat recovery and utilization in iron and steel industry, such as steel manufacturers, energy supply companies, solutions providers, academics, research institutes, policy makers.

The aims of the webinar and workshop are :

- Overview of waste heat potential (integrated and EAF route)
- Overview of existing waste heat recovery systems in steel plants
- Typical waste heat utilization possibilities as well as global application examples of already applied concepts (district heating, steam generation, electric power production, heat supply to other industries, etc.)
- Advanced options for waste heat recovery (e.g. from intermediate products, etc.) as well as heat storage
- Outlook on current developments & innovative technologies

SCIENTIFIC COMMITTEE

- Thomas Steinparzer (Primetals Technologies)
- Enzo Chiarullo (Ternova)
- Gerard Griffay (ArcelorMittal)
- Olivier Brégand (CRM)
- Agnieszka Morillon (FEHS)
- Mustapha Bsibsi (Tata Steel)

ORGANIZING COMMITTEE

- Thomas Steinparzer (Primetals Technologies)
- Enzo Chiarullo (Ternova)
- Delphine Snaet (ESTEP)

ABSTRACT SUBMISSION

Authors wishing to present a contribution are asked to prepare an abstract about 1,000 characters. Figures and references can be included (max abstract length 2 pages). Please submit the abstract to the ESTEP Secretariat by e-mail to: D.Snaet@estep.eu. In addition, please indicate the topic and the intention (or not) to submit a paper.

PARTICIPATION FEE

- Free for speaker in the related session
- 50 € per person for 1 session
- 150 € per person for all 4 sessions

Student fee (all 4 sessions)

- 60 € per student (only for first 30 registered students – further students can participate to the workshop paying the standard fee - the student status, e.g. bachelor, master and PhD, must be certified); a certificate of attendance will be released to all the students.

Company fees (all 4 sessions)

- 250 € for 2 persons
- 300 € for 3 persons
- 350 € for >3 persons (max 25)

Fee is used by ESTEP for workshop organization as well as generation and provision of the proceedings and related publications.

Workshop (session 4) participation is free for all people who participated in at least one webinar session.

THE WEBINAR SESSIONS

1. Waste heat potential and recovery solutions

The topic is focused on the current situation as well as state of the art solutions for waste heat recovery. Contributions on all stages of the supply chain are expected including but not limited to:

- Overview on waste heat potential and opportunities;
- State-of-the art solutions;
- Best practice examples from steel plant operators.

2. Waste heat recovery solutions and advanced options

The topic mainly concerns advanced waste heat recovery solutions which are already on an industrial prototype level.

3. Outlook on future developments

An outlook on latest developments in waste heat recovery with a special focus on thermoelectric generators as well as a comprehensive view considering future transitions in iron and steel industry (enhanced EAF scrap route) and integration of waste heat into external networks (e.g. sector coupling) is given.

THE WORKSHOP SESSION

4. Interactive Workshop

The final session will be an interactive workshop, in which the missing factors for a wide application of waste heat recovery systems in iron & steel industry shall be identified in small working groups for individual techno-economic topics. The missing factors identified in the small working groups will be afterwards collected as well as jointly evaluated and shall be basis for future roadmaps. Target of the workshop is to identify the white spots for a wide application and elaborate a basis for future roadmaps. The techno-economic topics for the working groups can be selected during registration.



Information and Contacts

For information and subscriptions, contact the ESTEP Secretariat, Mrs. Delphine Snaet - D.Snaet@estep.eu

FINAL PROGRAMME

| Webinar Session 1 (04.05.21): Waste Heat Potential and Recovery Solutions | | | |
|--|--|--------------------------------------|--|
| Duration | Presentation | Presenter | Session Hosts |
| 13:00-13:15 | Opening words | | Gerard Griffay (AM), Mustapha Bsibsi (TATA) |
| 13:15-13:45 | Industrial Waste Heat Recovery – An overview on available solutions in modern steel plants | Paul Trunner, Primetals Technologies | |
| 13:45-14:15 | Potential of the waste heat recovery in the steel shop | Enzo Chiarullo, Tenova | |
| 14:15-14:45 | Industrial District Heating in Linz, Austria | Thomas Keplinger, voestalpine | |
| 14:45-15:15 | The future use - Smart heat recovery and utilization in steel site | Tom van der Velde, Tata Steel Europe | |
| 15:15-15:45 | Turboden solutions to reach low emission steelmaking | Sabrina Santarossa, Turboden | |
| 15:45- 16:15 | Different examples of energy recovery systems from Off gas of the EAF of FeralpiGroup depending on different opportunities in different sites configurations | Piero Frittella, Feralpi | |
| 16:15-16:30 | Closure of the session | | |

| Webinar Session 2 (11.05.21): Waste Heat Recovery Solutions & Advanced Options | | | |
|---|---|---|---|
| Duration | Presentation | Presenter | Session Hosts |
| 13:00-13:15 | Opening words | | Thomas Steinparzer (Primetals Technologies), Enzo Chiarullo (TENOVA) |
| 13:15-13:45 | Scaling-up advanced waste heat recovery solutions, from laboratory to industrial plants | Olivier Bregand, CRM | |
| 13:45-14:15 | Heat Recovery of Sinter Circular Cooler by an Integrated Dedusting and Heat Recovery System | Rongshan Lin, Dillinger | |
| 14:15-14:45 | Heat pipe assisted annealing for energy saving in continuous annealing | Metin Celik, Tata Steel Europe | |
| 14:45-15:15 | ECOSLAG – Heat Recovery for Operational Practice | David Algermissen, FEHS & Virpi Leinonen, SFTEC | |
| 15:15-15:45 | ECOSTOCK®: High Temperature Energy Storage Solution | Gaétan Mandagot, ECOTECH | |
| 15:45-16:00 | Closure of the session | | |

| Webinar Session 3 (18.05.21): Outlook & Future Developments | | | |
|--|--|-------------------------------------|---|
| Duration | Presentation | Presenter | Session Hosts |
| 13:00-13:15 | Opening words | Morillon / Bregand | Agnieszka Morillon (FEHS), Olivier Bregand (CRM) |
| 13:15-13:45 | Research paths for waste heat recovery: the contribution of ESTEP roadmap for an improved EAF scrap route | Ismael Matino, SSSA (TENOVA, ESTEP) | |
| 13:45-14:15 | Integration of industrial excess energy in external networks from a legal-economic perspective | Simon Moser, Energieinstitut JKU | |
| 14:15-14:45 | Waste heat thermoelectric exploitation in steelmaking: a critical review | Marco Bianchi, Acc. Venete | |
| 14:45-15:15 | HEAT-R ENV: Improving the energy efficiency of steel industries using waste heat recovery units based on thermoelectric modules. | Raul Aragones, AEInnova | |
| 15:15-15:45 | INDUEYE-2.0: Making the steel industry more digital, sustainable and efficient using new long-range wireless edge-computing IoT devices fully powered by waste heat. | Raul Aragones, AEInnova | |
| 15:45-16:15 | Radiant Heat Capturing Device for Steel Mills | Saioa Herrero, Tekniker | |
| 16:15-16:30 | Closure of the session | Morillon / Bregand | |

| Session 4 (01.06.21): Workshop | | | |
|---------------------------------------|---|--------------------------|---|
| Duration | Agenda | Moderator | Session Hosts |
| 13:00-13:10 | Welcome & Dial-in | Moderator | Thomas Steinparzer (Primetals Technologies), Enzo Chiarullo (TENOVA) |
| 13:10-13:25 | Explanation of workshop concept, target, procedure | Moderator | |
| 13:25-13:30 | Division into break-out rooms / topics | Moderator | |
| 13:30-14:30 | Discussion / elaboration in each break-out rooms / topics | Participants | |
| 14:30-15:45 | Presentation and evaluation of break-out rooms / topics results | Participants / Moderator | |
| 15:45-16:00 | Wrap-up & Summary | Moderator | |