

FINAL Minutes of October 15, 2020 Ethylene Producers' Environmental Sub-Committee Meeting
(October 15, 2020, Rev. 0)

Following are the minutes of the October 15, 2020 Ethylene Producers' Environmental Sub-Committee Meeting, held via teleconference with Walter Postula, Shell Global Solutions (US) Inc., as host.

Present: Rick Beleutz, LyondellBasell
Ahmad Hamad, Siemens
Jacob Hilbrich, ChevronPhillips
Brandon Lithgoe, NOVA Chemicals
Dan Lutz, Ineos
Arijit Pakrasi, Edge Engineering and Science
Jennifer Port, ExxonMobil Chemicals
Walter Postula, Shell Global Solutions (US) Inc.
Gerardo Ruiz-Mercado, US EPA (AIChE Environmental Division)
Jason Trembly, Ohio University (AIChE Environmental Division)
Mark Ulrich, Linde Engineering North America

Absent: Benjamin Burns, SASOL North America
David Elam, TRC Solutions
Andrés Muñoz Gandarillas, Neste
Ted Heron, The Catalyst Group
Brad Hopper, BASF
Patti Long, Eastman
Mark Schmidt, Dow
Jeffrey Seay, University of Kentucky (AIChE Environmental Division)
Debalina Sengupta, Texas A&M (AIChE Environmental Division)
Dick Siegel, R&B Consulting Services (AIChE Environmental Division)
Edward Soliz Jr., SASOL North America
Gary Wojnowski, BASF
Russell Wozniak, Dow

The teleconference began at 9:02am with Walter Postula reading the Ethylene Producers' Committee (EPC) anti-trust statement:

No activity of the committee shall involve the exchange, collection, or dissemination of information among competitors for the purpose of bringing about or attempting to bring about an understanding or agreement, written or oral, formal or informal, express or implied, among competitors, with regard to costs, prices, pricing methods, terms or conditions of sale, distribution, production quotas or other limitations on either the timing or volume of production or sales, or allocation of territories or customers.

The meeting agenda was published in advance and is included below:

- 1) Reading of Anti-Trust Statement [9:02 AM]
- 2) Discussion of Potential Topics (list is below) for 2021 Environmental Session [9:04 AM]
 - a. Waste plastic liquids a steam cracker feed (Andrés Muñoz, Neste, planning paper)
 - b. Electrification of crackers
 - c. Use of fixed sensors for LDAR compliance (per Gary, impact2wo is interested in presenting)
 - d. Rejected papers from 2020 session (see September 10th minutes for abstracts)

- i. "Flare Instrumentation – Minimum Expectations," Derek Stuck, Spectrum Environmental
 - ii. "The Proposed Ethylene Production NESHAP and Potential Complications with Reclaimed Water Use," Bill Celenza and Sarah Shank, KBR
 - iii. "Proposed Ethylene MACT Flare Requirements," Herman Holm, Spectrum Environmental
 - iv. "A Novel Approach of Converting Industrial Wastewater into Energy," Chad Felch, Siemens (Ahmad Hamed sponsor?)
- 3) Other potential topics? [9:35 AM]
 - 4) Review of Action Items [9:45 AM]
 - 5) Important Date Reminders
 - September 11, 2020 – Call for abstracts opens
 - November 20, 2020 – Call for abstracts closes
 - December 13, 2020 – Papers accepted or rejected
 - January 15, 2021 – Draft schedule available
 - January 18, 2021 – Program goes live
 - March ??, 2021 – Paper submission closes
 - April 18-22, 2021 – Spring Meeting – Dallas, TX
 - 6) Adjourn [10:00 AM]

Discussion of Potential Topics for Environmental Session: Before diving into the previously developed list, Walter brought forward a suggestion from Dave Elam (who could not attend). Dave felt that we should be actively recruiting new authors and current topics rather than pulling rejected abstracts from the previous year. Those on the call agreed that focus should be on most up-to-date, currently relevant topics, but should not dismiss previous year abstracts if we believe they still have appeal.

Brandon suggested that we could use the theme of "ESG" (environmental, social, governance). How is ethylene industry working toward meeting ESG goals, i.e. projects to reduce GHG, energy intensity, plastics recycle, water use, etc. Dan brought up that assuming we can recruit papers on the "technology side," maybe we can also have someone talk about NGOs and pace of change. Ahmad asked if members' social media (LinkedIn) could be used to recruit authors as well. The subcommittee did not see any issue with doing so. Rick will ask AIChE what their position is, and what they have been doing, on social media with respect to soliciting abstracts.

The topic list generated during the September meeting, and shown in the agenda, was reviewed. Review of the abstract (once available) on the waste plastic liquid as cracker feed topic is needed to determine if it is more of a fit for a Technology or Feedstock session (though is not precluded from Environmental Session). Jake stated (via the CPChem Feedstock rep) that they were not pursuing but are interested. Mark Ulrich confirmed that Dr. Gunther Kracker of Linde was willing to present on the topic of CO₂ reduction by means of electrification. The short abstract is included at end of minutes. Rick will check on whether this could be a joint paper with Lyondell Basell's Wesseling site. Follow-up is needed on the mpact2wo abstract submission. Jake has not yet checked with authors from 2020 abstracts. Of the rejected 2020 papers, (i) and (ii) seem to have good potential. (iii) has been well covered the past couple years. (iv) could be applicable.

Improvements in Submission Process: Prior to discussing the action items we spent some time on a second topic that Dave Elam broached, which was the ease/clarity of the submission process. EPC does have specific processes on-top of those from AIChE. Walter asked Jake for his perspective as he was also an author for 2020. Jake said communication was good early on with his Session Chair, but essentially disappeared later. Jake relied on communication that Brandon was sending to the Environmental authors to help him. Brandon stated that feedback from AIChE on questions was timely. Since Brandon was not in attendance for the September call he also added (as conference feedback) that he wished he had control over the start/stop time of presentations. Walter mentioned that a revisit of EPC formatting guidelines was probably in order. Use of the EPC Program Chair is also encouraged as they should be receiving guidance from AIChE to pass along to the Session Chairs.

Review of Action Items: **Mark Ulrich** to send Linde's Dr. Gunther Kracker's abstract to Jake, Walter, and Rick (Done). **Rick Beleutz** will ask AIChE what their position is, and what they have been doing, on soliciting abstracts via social media. **Rick Beleutz** to check with Lyondell Basell's Wesseling site as potential to partner with Linde on paper. **Gary Wojnowski** to follow-up on mpact2wo submission of abstract on LDAR topic (Done, they will not submit abstract). **Jake Hilbrich** will follow up with 2020 abstract authors on interest to have abstract considered for 2021 conference. **Walter Postula** to share attendance numbers from each presentation (Done, see page 4).

Important Date Reminders: The dates for the 2021 Spring Meeting are listed in the "agenda" section. AIChE has pledged to communicate with EPC in early December regarding decision on 2021 being a virtual conference also.

Adjourn: The meeting/teleconference was closed at 9:57 am.

Potential Paper for 2021 Session

Dr. Gunther Kracker (Linde) – “Electrification of Steam Cracking and Related Challenges”

With increasing societal and legislative pressures on our petrochemical industry especially with regards to GHG emissions, there is a clear demand for viable technological solutions which effectively reduce GHG emissions from steam cracking technology. Far beyond merely storing and reutilizing CO₂ (i.e. CCs and CCU) we need to directly reduce CO₂ emissions from steam cracking. A key promising technological option to do so is via electrification, i.e. via utilizing renewable power generation's carbon neutral energy production. The paper and associated presentation will summarize various electrification measures specific to steam cracking technology, ranging from furnace electrification to the challenges of electrification of the large turbo-compression machinery within the process. Finally, the paper will elaborate on the combined overall plant electrification concepts for crackers.

Attendance Numbers from 2020 Virtual EPC Environmental Session:

160a	88
160b	40
160c	31
160d	51
160e	95

Overall conference attendance (1311), when put in comparable terms, was slightly down from previous years (2018: 1429, 2019: 1456).