

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PACIFICORP,
MIDAMERICAN ENERGY COMPANY, AND
WEC ENERGY GROUP, INC.,
Petitioners

v.

BIRCHTECH CORP.
(f/k/a MIDWEST ENERGY EMISSIONS CORP.)
Patent Owner

Case IPR2025-00717
Patent 10,926,218

**PATENT OWNER'S SUR-REPLY TO PETITIONERS' REPLY TO
PATENT OWNER'S PRELIMINARY RESPONSE**

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TABLE OF CONTENTS

I. Introduction.....1

II. Combinations and Teachings of Vosteen589 1

 A. No Motivation to Combine Vosteen589 with Starns and
 Mass-EPA.....1

 B. No Disclosure of Adding Iodide Salt to Coal and Combustion
 Chamber. 2

III. Combinations and Teachings of Lissianski.....4

IV. Conclusion 6

Exhibit List	
Exhibit	Description
2001	Declaration of Justin T. Nemunaitis
2002	Declaration of Richard Cochrane
2003	Original Complaint for Patent Infringement, <i>Midwest Energy Emissions Corp., et al. v. Vistra Energy Corp., et al.</i> , C.A. 1:19-cv-01334, ECF No. 1 (D. Del. July 17, 2019)
2004	Transcript of Jury Trial, <i>Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.</i> , C.A. 1:19-cv-01334 (D. Del.) (Feb. 26, 2024–March 1, 2024)
2005	Non-Final Judgment Following Jury Verdict, <i>Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.</i> , C.A. 1:19-cv-01334, ECF No. 697 (D. Del. March 8, 2024)
2006	Case Management Order, <i>In re: Midwest Energy Emissions Corp. Pat. Litig.</i> , No. 4:24-md-03132-SHL-WPK, ECF No. 60 (S.D. Iowa March 7, 2025)
2007	Complaint for Patent Infringement, <i>Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Company, et al.</i> , 4:24-cv-00243-SHL-WPK, ECF No. 1 (S.D. Iowa July 18, 2024)
2008	PacifiCorp’s First Amended Answer, Affirmative Defenses, and Counterclaims in Response to Plaintiff’s First Amended Complaint for Patent Infringement, <i>In re: Midwest Energy Emissions Corp. Pat. Litig.</i> , No. 4:24-md-03132-SHL-WPK, ECF No. 82 (S.D. Iowa March 21, 2025) (Redacted)
2009	Defendant MidAmerican Energy Company’s First Amended Answer, Affirmative Defenses, and Counterclaims to Plaintiff’s First Amended Complaint, <i>In re: Midwest Energy Emissions Corp. Pat. Litig.</i> , No. 4:24-md-03132-SHL-WPK, ECF No. 83 (S.D. Iowa March 21, 2025) (Redacted)
2010	Defendant Wisconsin Power and Light Company’s First Amended Answer, Affirmative Defenses, and Counterclaims to First Amended Complaint, <i>In re: Midwest Energy Emissions Corp. Pat. Litig.</i> , No. 4:24-md-03132-SHL-WPK, ECF No. 87 (S.D. Iowa March 21, 2025) (Redacted)

2011	Opening Expert Report of Dr. Stephen Niksa, <i>Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.</i> , C.A. 1:19-cv-01334 (D. Del.)
2012	Pilot- and Full-Scale Demonstration of Advanced Mercury Control Technologies for Lignite-Fired Power Plants, Quarterly Report (for the Period October 1, 2003 – December 31, 2003), dated February 2004
2013	Pilot- and Full-Scale Demonstration of Advanced Mercury Control Technologies for Lignite-Fired Power Plants, Final Report, dated February 2005
2014	Mercury Control Technologies for Electric Utilities Burning Subbituminous Coals, Final Report (For the period January 1, 2004 through June 30, 2005), dated October 2005
2015	Center for Air Toxic Metals (CATM), 2003 Research Ideas, dated August 30, 2002
2016	Document Metadata for Center for Air Toxic Metals (CATM), 2003 Research Ideas
2017	Declaration of Thomas Erickson including PTC logbook entries
2018	Declaration of Inventor John Pavlish, dated July 27, 2020
2019	Plaintiff ME2C's Brief in Support of Its Motion for Preliminary Injunction, <i>Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Company, et al.</i> , 4:24-cv-00243-SHL-WPK, ECF No. 58-1 (S.D. Iowa Oct. 11, 2024)
2020	Defendants' Brief in Support of Their Resistance to Plaintiff's Motion for Preliminary Injunction, <i>Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Company, et al.</i> , 4:24-cv-00243-SHL-WPK, ECF No. 125 (S.D. Iowa Dec. 16, 2024) (Redacted)
2021	Plaintiff ME2C's Reply Brief in Support of Its Motion for Preliminary Injunction, <i>Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Company, et al.</i> , 4:24-cv-00243-SHL-WPK, ECF No. 139 (S.D. Iowa Dec. 23, 2024) (Redacted)
2022	DTE Electric Company Affiliates Report, dated December 31, 2023

2023	First Amended Complaint for Patent Infringement, <i>Midwest Energy Emissions Corp., et al. v. Vistra Energy Corp., et al.</i> , C.A. 1:19-cv-01334, ECF No. 130 (D. Del. July 15, 2020)
2024	EPA, “Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units—Final Report to Congress”
2025	EPA Clean Air Act Overview, https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary-title-iii
2026	EPA, Mercury Study Report to Congress Vol. I (1997)
2027	EERC internal presentation, “Description of Test Facilities Particulate Test Combustor”
2028	EERC internal presentation, “Mercury Control Technologies for Electric Utilities Burning Lignite Coals, Introduction to Project” (12/4/2001)
2029	EERC internal presentation, “Mercury Control Technologies for Electric Utilities Burning Lignite Coals Project Kickoff Meeting” part 1 (2/28/2002)
2030	EERC internal presentation, “Mercury Control Technologies for Electric Utilities Burning Lignite Coals Project Kickoff Meeting” part 2 (2/28/2002)
2031	EERC internal presentation, “Mercury Control Technologies for Electric Utilities Burning Lignite Coals, Project Review Meeting” (2/25/2003)
2032	“JV TASK 45 – MERCURY CONTROL TECHNOLOGIES FOR ELECTRIC UTILITIES BURNING LIGNITE COAL, PHASE I BENCH- AND PILOT-SCALE TESTING Final Report” (Oct. 2003) (the “Oct. 2003 Report”)
2033	Metadata for Notes on Center for Air Toxic Metals (CATM) 2003 Research Ideas
2034	DOE, Success Story for Sorbent Enhancement Additives
2035	EPA, Mercury and Air Toxics Standards, https://www.epa.gov/mats/cleaner-power-plants
2036	Order Denying Motions to Stay and Motion to Compel, <i>In re: Midwest Energy Emissions Corp. Pat. Litig.</i> , No. 4:24-md-03132-SHL-WPK, ECF No. 131 (S.D. Iowa May 22, 2025)

2037	RESERVED
2038	RESERVED
2039	RESERVED
2040	RESERVED
2041	RESERVED
2042	RESERVED
2043	J. D. Kilgroe, C. B. Sedman, R. K. Srivastava, J. V. Ryan, C. W. Lee, S. A. Thorneloe, <i>Control of Mercury Emissions from Coal-Fired Electric Utility Boilers: Interim Report</i> , U.S. Environmental Protection Agency, Office of Research and Development, EPA-600/R-01-109, April 2002.
2044	RESERVED

I. Introduction

The Board has authorized this Sur-Reply to address two issues: (a) arguments concerning Vosteen589 and the procedural history of the prior proceedings and (b) arguments concerning Lissianski reference. First, a POSITA would not be motivated to combine Vosteen589 with secondary references Starns and Mass-EPA. Second, Petitioner misrepresents Lissianski, which does not disclose adding halogen additives to the combustion chamber. Even if it did, Lissianski's disclosures would lead a POSITA away from using an iodine halogen additive. Thus, all of Petitioner's Lissianski-based grounds fail.

II. Combinations and Teachings of Vosteen589

A. No Motivation to Combine Vosteen589 with Starns and Mass-EPA.

The Petitioners' Reply declines to address two key issues raised in Patent Owner's Preliminary Response. First, this precise obviousness issue was extensively considered during prosecution of the '114 Patent by the examiner, who found Patent Owner's arguments persuasive. POPR at 13–14; Ex. 1026 at 203–04, April 19, 2019 Office Action at 8–9. Further, as explained in the POPR, the general understanding in the industry was that sorbent additives such as halogens or halides should be mixed with sorbents *before* coming in contact with mercury-containing flue gas. POPR at 18–19. Thus, the objective evidence teaches away from the claimed invention. POPR at 14–19. Second, Dr. Niksa's testimony has

changed since the earlier IPRs where the Board found that his testimony lacked support. IPR2020-00834, Paper 18 at 17–18. Different testimony now should be given little weight.

Thus, there is no motivation to combine Vosteen589 with Starns or Mass-EPA. The objective evidence teaches away from the combination.

B. No Disclosure of Adding Iodide Salt to Coal and Combustion Chamber.

In their Reply, Petitioners mischaracterize the teaching of Vosteen589. In particular, Petitioners says that “Vosteen589 describes adding *iodine-based additives to coal and the combustion chamber* to oxidize mercury and make it more readily adsorbable.” Reply at 3 (citing Vosteen589 ¶ [0007]). But paragraph [0007] of Vosteen589 says:

“The removal of mercury from the flue gases in a flue gas emission control system downstream of the combustion or a similar high-temperature process is critically dependent on what species of mercury is present prior to entry into the flue gas emission control system. As high a proportion as possible of ionic mercury is advantageous, since the ionic mercury is readily water soluble, that is to say it can be scrubbed out, and is readily adsorbable to a range of adsorbents. *The addition of bromine or bromine compounds to the furnace causes*, under the given conditions of a high-temperature process or the like, in the presence of a sulphur compound, in particular in the presence of sulphur dioxide, *a substantial, essentially*

complete, oxidation of the mercury and therefore allows substantial removal of the mercury from flue gases.”

Ex. 1005 ¶ [0007] (emphasis added). In other words, Vosteen589 only discusses bromine as achieving the stated result. Dr. Niksa’s Declaration likewise ignores Vosteen589’s specific invocation of bromine. *See* Ex. 1002 ¶ 282 (citing ¶ [0007] of Vosteen589 and stating that “Vosteen589 uses halogen-containing ingredients (such as HBr or HI) to oxidize mercury” without support). Petitioners’ discussion of hydrogen bromide and sodium bromide is irrelevant. Reply at 4.

Petitioners point to paragraph [0016] of Vosteen589 as teaching “substituting iodine-based compounds for bromine-based compounds.” Reply at 4. As explained in the POPR, at most, Vosteen589 teaches that a waste incinerator may be able to reduce the amount of bromine additive employed when combusting high iodine waste. POPR at 20. But this is simply not a teaching that a POSITA should add high iodine waste to a coal combustion chamber. Indeed, such a result would likely cause a catastrophic failure as waste incinerators are not interchangeable with coal combustors. The claims of Vosteen589 can not expand the disclosure of Vosteen589 as Petitioners’ Reply indicates—they are understood in light of the actual, narrower disclosure of Vosteen589. Reply at 5.

III. Combinations and Teachings of Lissianski

In its POPR, Patent Owner explained that Lissianski fails to disclose combustion of coal with an iodine additive because it consistently discloses that iodine additives—if used at all—should be injected into the flue, *i.e.*, after combustion. In response, Petitioners cite Ex. 1014 at 4:14–16, 7:20–23, 8:40–44. But all of these citations disclose injection of iodine into **flue gas**, not the combustion chamber. This proves Patent Owner’s point.

Petitioners also note that the figures in Lissianski depict halogen agent “36” being added to portions of the combustion chamber. Reply at 6. However, Lissianski merely uses the number 36 to refer to aqueous solutions. The actual descriptions of those figures again clarify that the specific halogen agents to be used are **not** iodine additives. *See, e.g.*, Ex. 1014 at 4:30–36.

Petitioners also argue that the “flue” is part of the combustion chamber such that Lissianski’s disclosure of injecting additives into flue gas should be treated as injecting additives into the combustion chamber. Reply at 7. But this is mere attorney argument. The only evidence of record is the unrebutted testimony of Petitioners’ own expert who testified that a person of skill in the art would understand that the flue is **not** part of the combustion chamber. *See* Ex. 1002 ¶ 74 (“It was known that the point within the furnace after the last bank of the superheater section, and before the entrance to the economizer, was commonly

referred to as the “furnace exit” and was understood as the transition point after which the combustion gases were referred to as flue gases from there forward.”).

Petitioners note Lissianski’s disclosure that the flue gas is “downstream from the primary combustion zone 26,” and they argue that this implies the flue could begin within a secondary portion of the combustion zone. Reply at 7 (citing Ex. 1014 at 4:17–20). However, Lissianski simply does not redefine the word “flue” as Petitioners would prefer. Their speculation simply cannot contravene the actual evidence.

Finally, Petitioners respond to Patent Owner’s argument regarding figure 9. Reply at 8. In its POPR, Patent Owner explained that even if Lissianski disclosed adding iodine additives to the combustion chamber—which it does not—the mathematical model depicted in figure 9 would lead a POSITA away from using iodine additives or to use them by injecting into the flue, not the combustion chamber. In response, Petitioners cite to portions of Lissianski unrelated to figure 9. Indeed, Petitioners do not dispute the core point that Lissianski teaches that halogen additives depicted in figure 9 only become effective in the lower temperatures of the flue. Given that teaching, Petitioners still offer no explanation as to why a POSITA would modify Lissianski to add halogen additives before the flue.

Accordingly, Petitioners’ Lissianski-based Grounds 3–6 all fail.

IV. Conclusion

For the reasons explained above and in its POPR, Patent Owner respectfully requests that the Board deny the Petition.

Dated: September 3, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6(e)(4)

It is hereby certified that on this 3rd day of September, 2025, a copy of the foregoing document was served via electronic mail, as consented to by Petitioners upon the following counsel of record:

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