

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BERKSHIRE HATHAWAY ENERGY COMPANY,
MIDAMERICAN ENERGY COMPANY, PACIFICORP, and
WEC ENERGY GROUP, INC.,
Petitioner,

v.

BIRCHTECH CORP.,
Patent Owner.

IPR2025-00274
Patent 10,343,114 B2

Before CHRISTOPHER M. KAISER, AVELYN M. ROSS, and
DAVID COTTA, *Administrative Patent Judges*.

ROSS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Berkshire Hathaway Energy Company, Interstate Power & Light Company, MidAmerican Energy Company, PacifiCorp, WEC Energy Group, Inc., and Wisconsin Power & Light Company¹ (collectively, “Petitioner” or “Petitioners”) filed a Petition requesting *inter partes* review of claims 1–30 of U.S. Patent No. 10,343,114 B2 (Ex. 1001, “the ’114 patent” or “the Challenged Patent”). Paper 1 (“Pet.”). Petitioner also filed an explanation regarding the necessity of multiple petitions (IPR2025-00274 and IPR2025-00278). Paper 2. Birchtech Corp. (“Patent Owner”) filed a Preliminary Response. Paper 19 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply to the Preliminary Response. Paper 24 (“Prelim. Reply”). Patent Owner also filed a Sur-reply to Petitioner’s Reply. Paper 27 (“Prelim. Sur-reply”).

Patent Owner filed a brief regarding Discretionary Denial. Paper 15. Petitioner filed an opposition to the Discretionary Denial Brief. Paper 18. Patent Owner filed a reply to Petitioner’s opposition to the Discretionary Denial Brief. Paper 20. Petitioner filed a sur-reply to Patent Owner’s reply to Petitioner’s opposition to the Discretionary Denial Brief. Paper 22. The Acting Director determined that “discretionary denial of institution is not appropriate” in this proceeding and referred the Petition to the Board. Paper 23.

¹ Interstate Power and Light Company and Wisconsin Power and Light Company subsequently settled their dispute with Patent Owner and have been terminated from this proceeding. Paper 30; Paper 32.

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the petition “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least [one] of the claims challenged in the petition.” The following findings of fact and conclusions of law are not final, but are made for the sole purpose of determining whether Petitioner meets the threshold for initiating review. Any final decision shall be based on the full trial record, including any response timely filed by Patent Owner. Any arguments not raised by Patent Owner in a timely-filed response may be deemed waived.

For the reasons stated below, we determine that Petitioner has established a reasonable likelihood that it would prevail with respect to at least one claim. We hereby institute an *inter partes* review as to claims 1–30 of the ’114 patent based upon Petitioner’s asserted grounds of unpatentability.

II. BACKGROUND

A. *Real Parties in Interest*

Petitioner identifies itself, as well as Alliant Energy Corporation, Alliant Energy Corporate Services, Inc., MidAmerican Funding, LLC, MHC Inc., PPW Holdings LLC, Madison Gas and Electric Company, and Wisconsin Public Service Corporation as the real parties in interest. Pet. 1–2. Patent Owner identifies “MES, Inc.” as the real party in interest. Paper 9, 1.²

² Paper 9 has all pages numbered 2. We consider the first of these pages as page number 1.

B. Related Matters

Petitioner indicates that it filed a concurrent petition against the '114 patent (IPR2025-00278). Pet. 3.

The parties identify the following matters as related to this proceeding:

Midwest Energy Emissions Corp. et al. v. Arthur J. Gallagher & Co. et al., No. 1:19-cv-01334 (D. Del.) (“the Delaware Action”);

Midwest Energy Emissions Corp. v. Ameren Corporation et al., No. 4-24-cv-00980 (E.D. Mo);

Midwest Energy Emissions Corp. v. Tucson Electric Power Co. et al., No. 3:24-cv-08145-DJH (D. Az.);

Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Co. et al., No. 4:24-cv-00248 (S.D. Iowa);

In re Midwest Energy Emissions Corp. Patent Litigation, No. 4:24-md-3132 (S.D. Iowa) (consolidating the Iowa, Arizona, and Missouri);

Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Company et al., No. 2-25-cv-00015 (D. Wy.);

Midwest Energy Emissions Corp. v. Wisconsin Power and Light Company, No. 3-25-cv-00026 (W.D. Wis);

Midwest Energy Emissions Corp. v. MidAmerican Energy Company et al., Case No. 4-24-cv-00243 (S.D. Iowa); and

Birchtech Corp. f/k/a Midwest Energy Emissions Corp. v. Evergy, Inc. et al., Case No. 4-25-cv-00050 (W.D. Mo).

Pet. 4–5; Paper 9, 1–2.

Petitioner additionally identifies the following proceedings as related matters:

IPR2025-00274
Patent 10,343,114 B2

NRG Energy, Inc. et al. v. Midwest Energy Emissions Corp.,
IPR2020-00832 (U.S. Patent No. 10,343,114) (filed Oct. 26,
2020);

NRG Energy, Inc. et al. v. Midwest Energy Emissions Corp.,
IPR2020-00834 (U.S. Patent No. 10,343,114) (filed Oct. 26,
2020);

NRG Energy, Inc. et al. v. Midwest Energy Emissions Corp.,
IPR2020-00926 (U.S. Patent No. 8,168,147) (filed Dec. 2, 2020);
and

NRG Energy, Inc. et al. v. Midwest Energy Emissions Corp.,
IPR2020-00928 (U.S. Patent No. 8,168,147) (filed Dec. 2, 2020).

Pet. 3–4.

We also note the following related proceedings:

Berkshire Hathaway Energy Co. et al. v. Birchtech Corp.,
IPR2025-00280 (U.S. Patent No. 10,596,517) (filed Jan. 24,
2025); and

Berkshire Hathaway Energy Co. et al. v. Birchtech Corp.,
IPR2025-00281 (U.S. Patent No. 10,596,517) (filed Jan. 24,
2025).

Petitioner additionally identifies the following applications as related
to the application of the '114 patent:

U.S. Patent Application No. 15/295,594 (filed Oct. 17, 2016);

U.S. Patent Application No. 14/102,896 (filed Dec. 11, 2013,
now U.S. Patent No. 9,468,886);

U.S. Patent Application No. 12/429,058 (filed Apr. 23, 2009,
now U.S. Patent No. 8,652,235);

U.S. Patent Application No. 12/201,595 (filed Aug. 29, 2008);

U.S. Patent Application No. 11/209,163 (“the ’163 application”)
(filed on Aug. 22, 2005, now U.S. Patent No. 7,435,286); and

U.S. Provisional Patent Application No. 60/605,640 (filed Aug. 30, 2004).

Pet. 5–6.

C. The '114 patent

The '114 patent, titled “Sorbents for the Oxidation and Removal of Mercury,” “relates to methods and materials for the removal of pollutants from flue gas or product gas from a gasification system,” and “[i]n particular, mercury is removed from gas streams generated during the burning or gasification of fossil fuels by highly reactive regenerable sorbents.” Ex. 1001, code (54), 1:27–31. The '114 patent discloses that the “combustion and gasification of fossil fuel such as coal generates flue gas that contains mercury and other trace elements that originate from the fuel” and “[s]everal types of mercury control methods for flue gas have been investigated, including injection of fine sorbent particles into a flue gas duct and passing the flue gas through a sorbent bed.” *Id.* at 1:33–35, 1:56–59. The '114 patent explains that a “major problem with existing carbon injection systems is that the sorbent is relatively unreactive toward mercury” and therefore “these sorbents must be used in large amounts.” *Id.* at 2:10–12. The '114 patent further describes other mercury sorbent approaches and their problems. *Id.* at 2:20–3:21.

The '114 patent describes a halogen/halide-promoted sorbent “that is highly effective for the removal of mercury from flue gas streams” and that the “sorbent comprises any activated carbon and/or non-carbon compound.” *Id.* at 3:36–39. Further, “[o]ptional secondary components and alkali may be added to further increase reactivity and mercury capacity.” *Id.* at 3:43–

44. The '114 patent states that “the optional secondary component is selected from the group consisting of Group V halides, Group VI halides, HI, HBr, HCl, and combinations thereof.” *Id.* at 4:52–55.

The '114 patent discloses in “an embodiment, the promoted sorbent is introduced by direct injection into the flue gas stream” and in “another embodiment, the base sorbent is promoted within the flue gas stream.” *Id.* at 5:41–43. The '114 patent describes that in “some embodiments, the carbon base sorbent and the promoter are introduced into the mercury-containing gas at the same location or at separate locations.” *Id.* at 7:5–8. For instance, the '114 explains for one example that “the sorbent is injected into the flue gas after the boiler” and the “additive can be injected where desired (e.g., before, after, or within the boiler).” *Id.* at 30:1–4.

The '114 patent explains that when “a promoted or a non-promoted base sorbent reacts with elemental or oxidized mercury, a mercury/sorbent chemical composition is formed and, in the case of elemental mercury reacting with the promoted base sorbent, the mercury is oxidized.” *Id.* at 3:53–57. The '114 patent further describes separating the promoted sorbent from the gas stream and adjusting “the rate at which the carbon base sorbent is introduced or the rate at which the promoter is introduced or combination thereof” according to a monitored mercury content of the cleaned gas “so that the mercury content of the cleaned gas is maintained at substantially the desired level with minimal operating cost.” *Id.* at 7:10–16.

D. Illustrative Claims

Claims 1 and 23–25 are independent. Claims 2–22 depend from claim 1 and claims 26–30 depend from claim 25. Ex. 1001, 33:49–36:48.

Claim 1 (with identifiers of claim elements, *see, e.g.*, Pet. xviii) is reproduced below.

1. A method of separating mercury from a mercury containing gas, the method comprising:
 - combusting coal in a combustion chamber, to provide the mercury-containing gas,
 - wherein the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br-, or a combination thereof, wherein
 - the coal comprises added Br₂, HBr, Br-, or a combination thereof, added to the coal upstream of the combustion chamber, or
 - the combustion chamber comprises added Br₂, HBr, Br-, or a combination thereof, or
 - a combination thereof;
 - injecting a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;
 - contacting mercury in the mercury-containing gas with the sorbent, to form a mercury/sorbent composition;
 - separating the mercury/sorbent composition from the mercury-containing gas, to form a cleaned gas;
 - monitoring the mercury content of the cleaned gas; and
 - controlling, in response to the monitored mercury content of the cleaned gas, an injection rate of injecting the sorbent into the mercury-containing gas, the sorbent composition, or a combination thereof,
 - so that the mercury content of the cleaned gas is maintained at or below a desired level.

Ex. 1001, 33:49–34:7.

E. Asserted Grounds of Unpatentability

Petitioner contends that claims 1–30 of the '114 patent are unpatentable on the following grounds:

Claims Challenged	35 U.S.C. §	References/Basis
1–30	103(a)	Vosteen589, ³ Starns ⁴
1–30	103(a)	Vosteen589, Mass-EPA ⁵
23, 25–27, 30	102(e)	Downs-Boiler ⁶
1–8, 12–30	103(a)	Downs-Boiler, Starns
1–30	103(a)	Downs-Boiler, Mass-EPA

Pet. 10. In support of its unpatentability arguments, Petitioner relies on the declaration testimony of Dr. Stephen Niksa. Ex. 1002.

III. MULTIPLE PETITIONS

Petitioner filed two petitions for inter partes review against claims of the '114 patent, challenging claims 1–30 in this Petition and the same claims

³ US 2004/0013589 A1, published Jan. 22, 2004, Ex. 1005 (“Vosteen589”).

⁴ Starnes, Travis, et al., *Full-Scale Test of Mercury Control with Sorbent Injection and an ESP at Wisconsin Electric’s Pleasant Prairie Power Plant*, Session AE1-C, Paper No. 43249, AIR & WASTE MANAGEMENT’S ASSOCIATION’S 95TH ANNUAL CONFERENCE, June 23–27, 2002, Ex. 1008 (“Starns”).

⁵ Massachusetts Dep. of Environmental Protection, Bureau of Waste Prevention, *Evaluation of the Technological and Economic Feasibility of Controlling and Eliminating Mercury Emissions from the Combustion of Solid Fossil Fuel*, Dec. 2002, available at <https://web.archive.org/web/20030411074158/http://www.state.ma.us/dep/bwp/daqc/files/mercfeas.pdf> and at <https://www.mass.gov/doc/evaluation-of-technologicaleconomic-feasibility-of-controlling-eliminating-mercuryemissions/download>, Ex. 1009 (“Mass-EPA”).

⁶ US 2008/0107579 A1, published May 8, 2008, Ex. 1006 (“Downs-Boiler”). Although the first inventor is named Downs (*id.* at code (76)), we follow the parties’ practice of referring to this reference as “Downs-Boiler.”

in IPR2025-00278. *See* IPR2025-00278, Paper 1. Patent Owner does not challenge that multiple Petitions are necessary. *See generally*, Prelim. Resp. Petitioner requests that we consider this Petition before we consider the Petition in IPR2025-00278. Paper 2, 3. Accordingly, we reserve consideration of whether multiple petitions are merited for the decision in IPR2024-00278.

IV. WHETHER THE PETITION IS TIME-BARRED

Patent Owner argues the Petition is time-barred and fails to identify all real parties-in-interest. Prelim. Resp. 56–61.

Under 35 U.S.C. § 315(b), an inter partes review “may not be instituted if the petition requesting the proceeding is filed more than [one] year after the date on which the petitioner, real party in interest, or privy of the petitioner is served with a complaint alleging infringement of the patent.” Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b). *See, e.g., Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00651, Paper 152 (PTAB Jan. 24, 2019) (precedential).

Whether an unnamed party is a real party-in-interest or a privy of the instant petitioner is highly fact dependent and “demands a flexible approach that takes into account both equitable and practical considerations.” *See Applications in Internet Time, LLC v. RPX Corp.*, 897 F.3d 1336, 1351, 1360 (Fed. Cir. 2018) (“AIT”); *Ventex Co., Ltd. v. Columbia Sportswear N. Am., Inc.*, IPR2017-00651, Paper 152 at 4–5 (PTAB Jan. 24, 2019) (precedential) (citing *Worlds Inc. v. Bungie, Inc.*, 903 F.3d 1237, 1242 (Fed. Cir. 2018)); Consolidated Trial Practice Guide, 13 (2019), <https://www.>

uspto.gov/TrialPracticeGuideConsolidated) (“CTPG”). “Courts invoke the terms ‘real party-in-interest’ and ‘privity’ to describe relationships and considerations sufficient to justify applying conventional principles of estoppel and preclusion.” CTPG 13. These requirements are designed to “protect patent owners from harassment via successive petitions by the same or related parties, to prevent parties from having a ‘second bite at the apple,’ and to protect the integrity of both the USPTO and federal courts by assuring that all issues are promptly raised and vetted.” *Id.* at 12–13. Factors to consider in determining whether a sufficient relationship exists include

- (1) an agreement to be bound; (2) pre-existing substantive legal relationships between the person to be bound and a party to the judgment (e.g., “preceding and succeeding owners of property”); (3) adequate representation by someone with the same interests who was a party (e.g., “class actions” and “suits brought by trustees, guardians, and other fiduciaries”); (4) assumption of control over the litigation in which the judgment was rendered; (5) where the nonparty to an earlier litigation acts as a proxy for the named party to relitigate the same issues; and (6) a special statutory scheme expressly foreclosing successive litigation by nonlitigants.

WesternGeco LLC v. ION Geophysical Corp., 889 F.3d 1308, 1319 (Fed. Cir. 2018); *Taylor v. Sturgell*, 553 U.S. 880, 894–95 (2008); *AIT Time*, 897 F.3d at 1351. But “the mere existence of some relationship between a petitioner and another entity is not sufficient” to place that petitioner in privity with that entity. *Google LLC v. DDC Technology, LLC*, IPR2023-00707, Paper 27 at 37 (PTAB Oct. 25, 2023). Instead, “that relationship must be related to [an earlier] lawsuit and be sufficiently close that it can be fairly said the petitioner had a full and fair opportunity to litigate the validity

of the patent in that lawsuit” or the evidence must show “that petitioner is simply serving as a proxy to allow another party to litigate the patent validity question that the other party raised in an earlier filed litigation.” *Id.*

Patent Owner argues that the Petition is time-barred based on the relationship between the parties named as Petitioners and unnamed real parties-in-interest (i.e., Talen and Chem-Mod)⁷ who were defendants in a prior patent infringement suit filed in Delaware 2019, i.e., the Delaware Action. Prelim. Resp. 56–62. According to Patent Owner, “Petitioners are coal plant owners and/or operators with a close relationship to Delaware Defendants. Consequently, the clock for time-barring this Petition ran from the time Delaware Defendants were served in the Delaware [Action].” Prelim. Sur-reply 2. For convenience, we break Patent Owner’s argument into two separate categories—(1) Patent Owner’s argument that petitioners who purchase coal from Chem-Mod are time-barred and (2) Patent Owner’s argument that PacificCorp is time-barred. Prelim. Resp. 58–61; Prelim. Sur-reply 5 (“Each Petitioner is in privity with one or more Delaware Defendants based on the nature of their business relationship and associated indemnity agreements”).

A. Petitioners who purchase coal from Mod-Chem

Patent Owner asserts that Petitioners Berkshire Hathaway Energy Company (“Berkshire”), MidAmerican Energy Company (“MidAmerican”), Interstate Power & Light Company (“IPL”), Wisconsin Power & Light

⁷ Talen Energy Corporation and Talen Energy Holdings, Inc. (collectively “Talen”) and Chem-Mod LLC (“Chem-Mod”), among others, were named as defendants in the Delaware Action. Ex. 2023.

Company (“WPL”), and WEC Energy Group, Inc. (“WEC”) (collectively “Chem-Mod Purchasers”) “and their-real parties-in-interest own power plants that used something called ‘the Chem-Mod Solution’ to burn coal.” Prelim. Resp. 59. Patent Owner “asserted that this Chem-Mod Solution caused direct infringement at Petitioner’s power plants” and that “Chem-Mod LLC and its various affiliates were named as Defendants in the Delaware Action.” *Id.*

More specifically, Patent Owner contends that “MidAmerican purchased refined coal from Chem-Mod sublicensees” and that Berkshire “owns and controls MidAmerican.” *Id.* at 60. Patent Owner further alleges that “Wisconsin Public Service Corporation, the parent of Petitioner WEC, purchased refined coal from Chem-Mod LLC sublicensee Arbor Fuels Company.” *Id.* (citing Ex. 2042). Patent Owner states that these “Petitioners have argued that Chem-Mod and its affiliates defended Patent Owner’s infringement claims and negotiated a license on their behalf.” *Id.* at 61. For these reasons, Patent Owner contends that “Chem-Mod and its affiliates are real parties in interest with respect to Petitioners WPL Berkshire Hathaway Energy Company, MidAmerican, IPL, and WEC,” and because Chem-Mod was a defendant in the 2020 Delaware Litigation, this Petition is time-barred. Prelim. Resp. 61.

Petitioner argues that the mere fact that “Chem-Mod and its affiliates supplied refined coal to some of Petitioners through agreements that expired in 2021” is insufficient to establish Chem-Mod as a real party-in-interest or create privity. Prelim. Reply 7. Petitioner’s argue that a generic indemnity agreement, like that provided by Chem-Mod to Berkshire, MidAmerican,

and WEC, without more, is insufficient to create privity or establish a real party-in-interest relationship. *Id.* at 8–9. Further, Petitioner explains that “the Chem-Mod entities have no current relationship with Petitioners.” *Id.*⁸

After reviewing the evidence of record, we are persuaded the instant Petition is not time-barred as to the Chem-Mod Purchasers. Generic indemnity agreements are insufficient, without more, to establish privity. *WesternGeco LLC*, 889 F.3d at 1321 (“a contractual and fairly standard customer-manufacturer relationship regarding the accused product” does not suggest, “without more, that the parties were litigating . . . [an] IPR[] as proxies for the other.”). The only relationship alleged to exist between Chem-Mod, its affiliates, and the Chem-Mod Purchasers is that of a supplier customer relationship. As part of that relationship the parties entered into supply agreements that included an indemnification provision for the purchased products. Exs. 2038–2042 (discussed at Prelim. Sur-reply 7–8). We acknowledge, but disagree with, Patent Owner’s argument that the terms of the indemnity “specifically targeted” the activities “at the heart of the infringement dispute.” Prelim. Sur-reply 8. Rather, the indemnification language in these agreements appears to be standard and typical of supply

⁸ Petitioner asserts that the supply agreements between the Chem-Mod Purchasers and Chem-Mod expired in 2021. For the reasons discussed below, we determine that the language of these agreements does not establish privity. In the event Patent Owner maintains its argument that the Chem-Mod Purchasers are in privity with Chem-Mod, the parties should address the legal impact, if any, of the expiration of these agreements on Patent Owner’s arguments.

agreements. *See* Ex. 2037, 26;⁹ Ex. 2038, 10–12; Ex. 2039, 10–12; Ex. 2040, 10–12; Ex. 2041, 10–12; Ex. 2042, 24–27. Such language, without more, “does not amount to a sufficiently-close relationship to warrant finding . . . privity.” *WesternGeco LLC*, 889 F.3d at 1321–22.

Patent Owner argues that other power plant operators recognized that their supply relationships with Chem-Mod made Chem-Mod a real part of interest in IPR2020-00832. Prelim. Resp. 59–61. This is not persuasive because the present inquiry considers the relationship between Chem-Mod and the Chem-Mod Purchasers, not between Chem-Mod and other non-party power plant operators. Moreover, the other power plant operators in IPR2020-00832 identified Chem-Mod only as a “potential” real party in interest (IPR2020-00832, Paper 3, 1–3) and, even if we were inclined to consider Chem-Mod’s relationship with these other power plant operators, the current record is devoid of evidence sufficient for use to determine the nature of such relationship.

Patent Owner asserts that “MidAmerican and WPL own power plants that were at issue in the Delaware Litigation, and they contend that the Chem-Mod-affiliated Defendants defended against Patent Owner’s

⁹ Exhibit 2037 is an agreement with WPL, who has recently been terminated from this *inter partes* review. Paper 32 (granting Joint Motion to Terminate as to Petitioner WPL). For purposes of this decision, we have considered whether WPL is in privity with Chem-Mod and/or whether WPL should have named Chem-Mod as a real party in interest. If Patent Owner maintains its position that Chem-Mod should have been named as a real-party-in interest, the parties should address whether we should consider privity and real-party-in interest issues with respect to Petitioners who have been dismissed from this proceeding.

infringement claims and obtained a license on their behalf, at least for some periods of time.” Prelim. Sur-reply 4 (citing Ex. 2009, 91; Ex. 2010, 107). If supported by persuasive evidence, the allegation that Chem-Mod obtained a license on behalf of MidAmerican and WPL could lend some support for Patent Owner’s position. But the evidence Patent Owner cites—two affirmative defenses in Answers to Patent Owner infringement allegation filed by MidAmerican and WPL in district court—is ambiguous at best. In relevant part the two affirmative defenses state:

FIFTH DEFENSE

ME2C’s claims as to MidAmerican are barred by a covenant not to sue. ME2C entered into a license and covenant not to sue that retroactively and prospectively authorized MidAmerican to practice the asserted claims of the patents-in-suit by covenanting not to sue MidAmerican for any alleged infringement of any claim of any patent-in-suit.

Ex. 2009, 91.

Fifth Defense – License/Release

30. WPL has a license to the Patents-in-Suit and/or has been released from this litigation.

Ex. 2010, 107. Neither of these affirmative defenses even mentions Chem-Mod, much less provides information sufficient for us to determine that, as Patent Owner asserts, Chem-Mod obtained a license on behalf of MidAmerican or WPL.¹⁰ Accordingly, on the current record. Patent

¹⁰ Petitioner contends that Patent Owner’s allegation that Chem-Mod negotiated licenses on behalf of certain Petitioners is “false.” Prelim.

Owner's allegation that Chem-Mod obtained licenses for MidAmerican and WPL does not support Patent Owner's position that MidAmerican and WPL are in privity with Chem-Mod and/or that MidAmerican and WPL should have named Chem-Mod as a real party in interest.

Patent Owner's assertion that "MidAmerican and WPL own power plants that were at issue in the Delaware Litigation" (Prelim. Sur-reply 4) could also lend some support for Patent Owner's position. But the evidence Patent Owner cites as support (Ex. 2009, 91; Ex. 2010, 107) does not speak to whether MidAmerican and WPL own power plants in Delaware and, if so, what their ownership stake in such plants is. Moreover, Patent Owner asserts that the power plant operators it sued in 2024—which includes MidAmerican and WPL—"are not incorporated in Delaware and thus could not have been included in the Delaware Litigation" (Prelim. Sur-reply 4), which suggests that their interest in the Delaware power plants at issue in the 2020 litigation was not substantial.

Patent Owner does not point to any record evidence that suggests the parties to the Delaware Action adequately represented Mod-Chem Purchasers' interests or that the Mod-Chem Purchasers controlled, directed, or funded the Delaware Action. *See generally* Prelim. Resp. and Prelim. Sur-reply. Nor does Patent Owner suggest that the Indemnified Petitioners are acting as a proxy for Chem-Mod and its affiliates in this case. *Id.* Thus, the relationship with Chem-Mod, its affiliates, and the Indemnified

Reply 5. According to Petitioner, certain Petitioners argued only that Patent Owner "cannot pursue infringement claims against refined coal that [Patent Owner] licensed." *Id.*

Petitioners was not “sufficiently close that it can be fairly said petitioner had a full and fair opportunity to litigate the validity of the patent in that lawsuit.” *Google*, IPR2023-00707, Paper 27 at 37.

In sum, mindful that Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b), the current record does not provide sufficient reason to doubt Petitioner’s assertion that Chem-Mod was not “funding the petition, advising on strategy, or controlling the decision to file or the arguments presented.” Prelim. Reply 1–2; *see also* Pet. 26–27. Indeed, the current record supports that the relationship between Chem-Mod and the Chem-Mod Purchasers was a standard supplier/customer relationship. Exs. 2037–2042. The evidence does not support that Chem-Mod negotiated a license on behalf of the Chem-Mod Purchasers or that the Chem-Mod purchases owned power plants that were at issue in the Delaware Litigation. Ex. 2009, 91; Ex. 2010, 107. Therefore, on this record, we determine that the relationship between the Chem-Mod and the Chem-Mod Purchasers does not support that Petition is time-barred.

B. PacifiCorp

Patent Owner identifies three primary reasons why Talen is a real party in interest with respect to Petitioner PacifiCorp. First, Patent Owner argues that “Petitioner PacifiCorp is a co-owner of at least one of the Talen power plants accused of infringement in Patent Owner ME2C’s Delaware action, i.e., the Colstrip power plant,” and “[a]s the named operator of that power plant, Talen defended the lawsuit and settled the litigation.” Prelim. Resp. 58. Second, Patent Owner notes that “PacifiCorp has alleged that Talen negotiated that settlement agreement on its behalf and for the benefit

of PacifiCorp.” *Id.* Third, Patent Owner asserts that “Talen specifically identified PacifiCorp as a real party in interest” in IPR2020-00832. *Id.* We address each of these arguments in turn.

The evidence supports Patent Owner’s argument that PacificCorp is a co-owner of the Colstrip power plant. Ex. 1113. However, PacificCorp owns only a 10% interest in the Colstrip plant. *Id.* The remaining 90% is owned by Talen (with a 30% interest), NorthWestern Energy (with a 30% interest), Puget Sound Energy (with a 25% interest), and Portland General Electric (with a 20% interest). *Id.* Patent Owner does not allege, or identify evidence supporting, that PacificCorp’s 10% ownership interest gave it any degree of control over Colstrip’s day-to-day operations, or any say in legal proceedings relating to the Colstrip plant. *See generally*, Prelim. Resp; Prelim. Sur-reply. Without more, we are not persuaded that PacificCorp’s 10% ownership interest in the Colstrip plant contributes meaningfully support Patent Owner’s argument that Colstrip co-owner, Talen, should have been named as a real party in interest.

We turn next to Patent Owner’s allegation that PacificCorp asserted that Talen negotiated a settlement agreement on PacificCorp’s behalf and for PacificCorp’s benefit. Prelim. Resp. 58. Here, our analysis is complicated by the fact that the evidence Patent Owner cites in support of its position—PacificCorp’s answer to the district infringement suit—is heavily redacted. Paragraphs 54–60 of PacificCorp’s Answer are representative and are reproduced below.

54. As a co-owner of the Colstrip Plant, PacificCorp is included within the scope of [REDACTED] in the Talen Agreement.

55. PacificCorp is one of the [REDACTED] in the Talen Agreement.

[REDACTED]
□ [REDACTED]
[REDACTED]

57. ME2C had a duty to abide by the terms of the Talen Agreement.

58. ME2C had a duty to not sue or threaten to sue the Talen Released Parties.

59. ME2C had a duty to not identify Talen Released Parties for any purpose as infringing in whole or in part any claim of any Patent-in-Suit.

60. By filing the instant suit against PacificCorp, ME2C breached and/or violated its [REDACTED] the Talen Released Parties in Section 2.2 of the Talen Agreement. *See* Exhibit 1 at Section 2.2.

Ex. 2008, 99. On the current record, we can only speculate as to the nature of the redacted material. We have reviewed the portions of PacificCorp’s answer cited by Patent Owner and cannot determine, for example, whether PacificCorp is one of the Talen Released Parties or, if so, what the nature of the release is. *Id.*; *see also id.* at 95–100. As a party to the Talen Agreement

(*id.* at 95), presumably this is information in Patent Owner’s possession. And, having filed suit against PacificCorp for infringement of the ’114 patent (Ex. 2007), Patent Owner must not agree that Talen negotiated a license to the ’114 patent on PacificCorp’s behalf.¹¹ Without more, we are not persuaded that the allegations in PacificCorp’s Answer meaningfully support Patent Owner’s argument that Colstrip co-owner, Talen, should have been named as a real party in interest.

Finally, we consider Patent Owner’s assertion that “Talen specifically identified PacificCorp as a real party in interest” in IPR2020-00832. Prelim. Resp. 54–55. In IPR2020-00832, Talen, “out of an abundance of caution,” identified PacificCorp, along with numerous other entities, as a “potential real party-in-interest.” IPR2020-00832, Paper 3, 1–3.¹² The Petition in IPR2020-00832 makes clear that none of the companies listed “agreed to be listed as a real-party in interest,” and none “is funding, controlling, or directing, or otherwise has an opportunity to control or direct this Petition or proceeding.” *Id.* at 2. The institution decision in that case recognized Talen’s belief that PacificCorp may be a real party-in-interest, but made no

¹¹ In its Preliminary Response, Patent Owner asserts that a license exists covering “activity at the Colstrip power plant” but none of PacificCorp.’s other plants.” Prelim Resp. 55 n.23.

¹² As Petitioner points out, at the time the Petition in IPR2020-00832 was filed, “the PTAB had not yet made precedential *SharkNinja*, which held that failing to name an RPI was “not jurisdictional” and that an unnamed RPI can be added later.” Prelim. Resp. 3 (citing *SharkNinja Operating LLC v. iRobot Corp.*, IPR2020-00734, Paper 11, at 18-20 (P.T.A.B., designated precedential Dec. 4, 2020)).

determination that Talen was in fact a real party-in-interest. IPR2020-00832, Paper 17, 9–10. Indeed, the Institution Decision explains that “over-identification of potential real parties-in-interest . . . does not appear to be a problem.” *Id.* Under these circumstances, Talen’s identification of PacifiCorp as a “potential real party-in-interest” in IPR2020-00832 does little to support Patent Owner’s position that PacifiCorp should have identified Talen as a real party-in-interest in this proceeding.

In sum, mindful that Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b), the current record does not provide sufficient reason to doubt Petitioner’s assertion that no unnamed party, including Talen, is “funding the petition, advising on strategy, or controlling the decision to file or the arguments presented.” Prelim. Reply 1–2; *see also*, Pet. 2. The current record supports that PacificCorp and Talen are co-owners of the Colstrip power plant and that the Patent Owner granted a license covering the Colstrip power plant. Ex. 1113, 1; Prelim Resp. 55 n.23. Without more, this relationship does not make Talen a real-party-in interest to this proceeding or support that PacificCorp was in privity with Talen during the Delaware Litigation. Therefore, on this record, we determine that the relationship between the PacifiCorp and Talen does not support that Petition is time-barred.

V. ANALYSIS OF ASSERTED GROUNDS

A. *Legal Standard*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed.

Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A claim may be invalid as anticipated by a prior art reference if “each and every limitation is found either expressly or inherently in a single prior art reference.” *Sanofi–Synthelabo v. Apotex, Inc.*, 470 F.3d 1368, 1375 (Fed. Cir. 2006) (quoting *Celeritas Techs. Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed.Cir.1998)). Anticipation under § 102 may be established by showing, as a matter of fact, that all elements arranged as specified in a claim are disclosed within the four corners of a reference, either expressly or inherently, in a manner enabling one skilled in the art to practice an embodiment of the claimed invention without undue experimentation. *See ClearValue, Inc. v. Pearl River Polymers, Inc.*, 668 F.3d 1340, 1344 (Fed. Cir. 2012).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and “the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art;

(3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

We analyze the asserted grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish a reasonable likelihood of success at trial.

B. Level of Ordinary Skill in the Art

In order to determine whether an invention would have been obvious at the time the application was filed, we consider the level of ordinary skill in the pertinent art at the critical time. *Graham*, 383 U.S. at 17. The resolution of this question is important because it allows us to “maintain[] objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quotation omitted). Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovention Toys, LLC v. MGA Entm’t, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) (“A less sophisticated level of skill generally favors a

determination of nonobviousness . . . while a higher level of skill favors the reverse.”).

Petitioner contends that a person of ordinary skill in the art (“POSITA”) “would have at least a bachelor’s degree in chemical engineering, mechanical engineering, or a related field of study with at least two years of experience implementing pollution control in power generation plants for natural gas, coal, and/or industrial waste incineration.” Pet. 10–11 (citing Ex. 1002 ¶¶ 48–51). Patent Owner does not dispute the level of ordinary skill in the art. *See generally*, Prelim Resp.

For purposes of this Decision, we adopt Petitioner’s proposal as reasonable and consistent with the ’114 patent specification and the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art may reflect an appropriate level of skill in the art).

C. Claim Construction

In an *inter partes* review, the Board interprets claim language using the district-court-type standard, as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). Under that standard, we give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1313–1314. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–1319.

Petitioner does not propose any claim term for construction at this time. Pet. 10. Patent Owner also does not propose any claim terms for construction but notes that the Board previously provided the following construction: “‘injecting a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber’ does not encompass blowing activated carbon into a filter, placing the filter in a structure, and then transporting mercury containing gas to the structure.” Prelim. Resp. 7 (citing IPR2020-00834, Paper 18 at 7–8). Patent Owner, however, states “[t]hat construction is not strictly necessary here because Petitioners do not assert Vosteen as an anticipation reference.” *Id.* at 8.

We do not construe any claim language at this time because doing so would have no effect on our analyses below and will not assist in resolving the present controversy between the parties. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

D. Challenges based on Vosteen589

Petitioner asserts that claims 1–30 are unpatentable under 35 U.S.C. § 103(a) as obvious over Vosteen589 in view of Starns (Ground 1) and over Vosteen589 and Mass-EPA (Ground 2). Pet. 10.

1. Vosteen589 (Exhibit 1005)

Vosteen589 is a patent publication titled “Process for Removing Mercury from Flue Gases.” Ex. 1005, code (54). Vosteen589 “relates to a process for removing mercury from flue gases of high-temperature plants, in

particular power stations and waste incineration plants.” *Id.* ¶ 1.

Specifically, Vosteen589 states that its

invention relates to a process for removing mercury from flue gases of high-temperature plants, in particular from power stations and waste incineration plants, in which bromine and/or a bromine compound and/or a mixture of various bromine compounds is fed to the if appropriate multistage furnace and/or to the flue gas in a plant section downstream of the furnace, the temperature during the contact of the bromine compound with the flue gas being at least 500° C., preferably at least 800° C., the combustion taking place in the presence of a sulphur compound, in particular sulphur dioxide, with or without the addition of sulphur and/or a sulphur compound and/or of a mixture of various sulphur compounds, and then the flue gas being subjected to an if appropriate multistage cleanup for removing mercury from the flue gas, which cleanup comprises a wet scrubber and/or a dry cleanup.

Id. ¶ 6.

Vosteen589 discloses that the bromine compound may be sodium bromide and can be in the form of a salt that can be added to waste mixture, coal, or the like to be burnt. *Id.* ¶ 13. Vosteen589 describes a flue gas emission control system including a dry emission control system that may use, for example, “cloth filters which are impinged with a blown-in finely pulverulent slaked lime/activated carbon or slaked lime/lignite oven coke mixture.” *Id.* ¶ 19. Vosteen589 further describes continuously measuring the mercury content of the flue gas and controlling the amount and/or mixture of bromine and/or bromine compound fed by Vosteen589’s emission control system. *Id.* ¶ 22.

2. *Starns (Exhibit 1008)*

Starns is titled “Full-Scale Test of Mercury Control with Sorbent

Injection and an ESP at Wisconsin Electric's Pleasant Prairie Power Plant." Ex. 1008, 1. Starns describes a project that "determine[s] the capabilities of injecting activated carbon ahead of particle control devices (PCD) to remove mercury" and "determine[s] the cost and impacts of this technology." *Id.* at 2.

Starns discloses that "[t]he most mature, retrofit technology available today is the injection of sorbents such as powdered activated carbon (PAC) into the flue gas upstream of the particle control equipment" in which "[t]he gas-phase mercury in the flue gas contacts the sorbent and attaches to its surface." *Id.* A PLC (programmable logic controller) system "is used to control system operation and adjust injection rates" of the sorbent. *Id.* at 7. Primary variables of the optimum operating conditions include "injection concentration" and "carbon type." *Id.* at 10. Accordingly, Starns provides a "full-scale evaluation of mercury control using activated carbon injection upstream of an ESP" (electrostatic precipitator, a particle control equipment). *Id.* at 3, 20.

3. *Mass-EPA (Ex. 1009)*

Mass-EPA is titled "Evaluation of the Technological and Economic Feasibility of Controlling and Eliminating Mercury Emissions From the Combustion of Solid Fossil Fuel." Ex. 1009, title page. Mass-EPA provides a report relative to "Massachusetts' regulation 310 CMR 7.29" that "establishes emissions standards for sulfur dioxide (SO₂), oxides of nitrogen (NO_x) and carbon dioxide (CO₂) from the six affected power plants and caps emissions of CO₂ from the facilities." *Id.* at 1.

Mass-EPA notes that “[m]ass transfer refers to the ability of the sorbent particles to contact the Hg in the flue gas.” *Id.* at 21, n25. Mass-EPA explains that “[m]ercury can be captured and removed from gas by injection of a sorbent into the exhaust system and subsequent collection of the particulates” thereby providing a “low-cost and efficient sorbents and effective particulate collection” methodology. *Id.* at 32. Activated carbon is used as a “sorbent for mercury adsorption.” *Id.* Mass-EPA states that “[r]esearch in understanding and improving mercury adsorption efficiency of activated carbons has been ongoing with the goal of improving carbon to mercury injection rates and reducing control costs.” *Id.* at 35.

4. *Independent Claim 25*

Petitioner discusses claim 25 first, because “the other independent claims copy its limitations.” Pet. 30 (citing Ex. 1002 ¶ 294). Petitioner alleges that Vosteen589 teaches each of the limitations of claim 25 except for the “injecting limitation,” i.e., “injecting a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber; contacting mercury in the mercury-containing gas with the sorbent, to form a mercury/sorbent composition,” which Petitioner alleges is taught by Starns and Mass-EPA. Pet. 30–35.

Regarding the preamble of claim 25, Petitioner asserts that Vosteen589 discloses “removing mercury from flue gases.” *Id.* (quoting Ex. 1005, code (54)). Claim 25 further requires “combusting coal in a combustion chamber, to provide the mercury-containing gas” which Petitioner contends is suggested by Vosteen 589. In particular, Petitioner asserts “Vosteen589 discloses ‘a coal-fired power station,’ which includes a

‘combustion chamber’” such that “[t]he combustion chamber combusts coal and provides the mercury-containing flue gas.” *Id.* (citing Ex. 1005 ¶¶ 5, 34, 46–48, Figs. 7–9; Ex. 1002 ¶¶ 298–300). Regarding the limitation “the coal comprises added Br₂, HBr, a bromide compound, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added Br₂, HBr, a bromide compound, or a combination thereof, or a combination thereof,” Petitioner argues that Vosteen589 discloses adding Br₂, HBr, and NaBr to the combustion chamber and/or to coal to be burnt. *Id.* at 31 (citing Ex. 1005 ¶¶ 6, 9, 13, 14, claims 1, 2; Ex. 1002 ¶¶ 301–302). For the limitation “separating the mercury/sorbent composition from the mercury-containing gas, to form a cleaned gas,” Petitioner argues that Volsteen589 discloses “removing mercury . . . from flue gases” such that it “clean[s] gas downstream of the . . . dry flue gas emission control system” which means the mercury/sorbent has been separated, and thus, “[t]he mercury/sorbent composition is separated downstream from the combustion chamber in a particle-control device (PCD), such as ESP or fabric filter.” *Id.* at 34 (quoting Ex. 1005 ¶¶ 5, 19, 22, 33, 34, 39, 42, 47–49, claim 8; Ex. 1002 ¶¶ 313–315). Petitioner argues that “ESPs were well-known components in coal-fired power plants to remove particulate matter, such as the mercury/sorbent composition” and “[t]o be effective, the sorbent must be injected after the combustion zone (where mercury-containing flue gas is generated) and before the separation system (where the sorbent is removed).” *Id.* at 34 (citing Ex. 1002 ¶¶ 86–88, 204, 314–315). Petitioner also argues that Starns discloses an electrostatic precipitator and recommends “using activated carbon injection upstream of

an ESP” and that the mercury/sorbent composition is removed, because “upstream of the particle control equipment” (ESP), the “gas-phase mercury in the flue gas contacts the sorbent and attaches to its surface.” *Id.* at 34–35 (quoting Ex. 1008 at 2, 20; citing Ex. 1002 ¶ 314).

Petitioner argues that each of Starns and Mass-EPA teach the injecting limitation. Pet. 32–34. Petitioner argues that Vosteen589 discloses a “dry-emission control system” for the “flue gas,” which works “based on the adsorption of ionic mercury compounds” and one exemplary sorbent is “finely pulverulent slaked lime/activated carbon” such that “[t]he flue-gas mercury is adsorbed, and thus contacted, with activated-carbon sorbent to form a mercury/sorbent composition.” *Id.* at 32 (citing Ex. 1005 ¶¶ 7, 17–19). Petitioner argues that Starns and Mass-EPA disclose “how and where to inject the activated-carbon sorbent into the flue gas.” *Id.* (citing Ex. ¶¶ 304–306, 309–310).

In particular, Petitioner argues that Starns describes the hardware and control processes for “injecting activated carbon ahead of particle control devices (PCD) to remove mercury” and that through “injection of sorbents such as powdered activated carbon (PAC) into the flue gas upstream of the particle control equipment,” the “gas-phase mercury in the flue gas contacts the sorbent and attaches to its surface.” *Id.* at 32–33 (quoting Ex. 1008 at 2; citing Ex. 1002 ¶¶ 307, 311). Petitioner explains that “Vosteen589 does not fully disclose certain implementational details” but Starns “suppl[ies] those details, including hardware and control processes.” *Id.* at 25. Petitioner asserts that a person of ordinary skill in the art would have reason to utilize an activated-carbon injection because activated carbon injection was well-

known in the art. *Id.* at 25–26 (citing Ex. 1001, 1:59–65, 11:8–16, 25:35–48; Ex. 1096, 41:5–9; Ex. 1095, 114:21–25; Ex. 1097, 210:4–18).

According to Petitioner, this combination “represents combining prior art elements (activated-carbon sorbent) according to known methods (injection into flue gas) to yield predictable results (mercury removal).” *Id.* at 26 (citing Ex. 1002 ¶ 282).

Petitioner also argues that Mass-EPA teaches activated carbon as “the most extensively studied sorbent for mercury adsorption” and injecting activated carbon “in numerous places.” *Id.* at 33–34 (citing Ex. 1009, 31–56). Petitioner explains that “[t]he ‘sorbent particles . . . contact the Hg in the flue gas.’” *Id.* (citing Ex. 1009, 6, 7, 21–23, 31–56; Ex. 1002 ¶¶ 308, 312). Petitioner argues that a person of ordinary skill in the art would have been motivated to use an activated carbon injection in Mass-EPA for similar reasons as in Ground 1, i.e., because “the combination of Vosteen589 and Mass-EPA represents nothing more than combining prior-art elements according to known methods to yield predictable results of removing mercury” and because Mass-EPA expressly states that “improving mercury adsorption efficiency of activated carbons has been ongoing with the goal of improving carbon to mercury injection rates and reducing control costs.” *Id.* at 28–29 (citing Ex 1009, 32, 39, 58, Ex. 1002 ¶¶ 289–293).

Patent Owner does not challenge Petitioner’s allegations regarding the teachings of Vosteen, Starns, or Mass-EPA. *See generally* Prelim. Resp. We have reviewed Petitioner’s arguments and evidence, and agree—based on the information provided in the Petition—that Petitioner has shown a reasonable likelihood that the combination of Vosteen with either of Starns

or Mass-EPA teaches each limitation of claim 25 of the '114 patent. Patent Owner does assert, however, that the skilled artisan would not have had reason to combine the teachings of Vosteen with either of Starns or Mass-EPA as Petitioner suggests. *Id.* at 8–13. We address Patent Owner's argument below.

Patent Owner asserts that “Petitioners fail to provide evidence of a motivation to combine and instead just rely on the fact that various mercury control techniques were known in the art. This approach fails as a matter of law.” Prelim. Resp. 8. Patent Owner contends that “Petitioner offers no evidence to support their conclusion other than the fact that the references qualify as prior art” and “because activated carbon injection was well known in the art.” *Id.* at 11 (emphasis removed). According to Patent Owner, “Petitioners identify no problem to be solved in Vosteen or other reason why a POSITA would be motivated to modify Vosteen.” *Id.* Patent Owner also argues that Dr. Niksa's testimony “does not fill this gap” and should be afforded little weight because his testimony is inconsistent with IPR2020-00834. *Id.* at 12. Lastly, Patent Owner asserts that during prosecution of the '114 patent, the examiner found that the person of ordinary skill in the art would not have modified the prior art in the manner suggested by Petitioner. *Id.* at 13–14.

On this record, we are persuaded Petitioner has adequately shown that the skilled artisan would have had reason to modify the teachings of Vosteen⁵⁸⁹ with either of Starns or Mass-EPA. For example, Petitioner contends that a person of ordinary skill in the art would have modified Vosteen's system to include the activated charcoal injection of Starns

because activated charcoal injection is “a ‘mature’ technology [and] the combination of Vosteen589 and Starns represents nothing more than combining prior art elements according to known methods to yield predictable results of removing mercury.” Pet. 28 (citing Ex. 1002 ¶¶ 286–287). Starns explains that the “most mature, retrofit technology available today is the injection of sorbents such as powdered activated carbon (PAC) into the flue gas upstream of the particle control equipment.” Ex. 1008, 2. Petitioner, through the testimony of Dr. Niksa, further explains that sorbent concentration affects the mercury removal rate and that Starns uses a control system to adjust injection rates. Ex. 1002 ¶¶ 282–286; *see also* Pet. 27–28 (same). With respect to the combination of Vosteen589 and Mass-EPA, Petitioner alleges that the skilled artisan would have had reason combine the references because the “‘estimated costs for powdered activated carbon injection-based technology, which most likely will reach commercialization for mercury control before other technologies, is within the current control costs for NOx’ (another type of pollutant).” Pet. 29 (citing Ex. 1009, 58). Furthermore, Petitioner alleges that Mass-EPA provides an express motivation by detailing improved adsorption efficiencies. *Id.* Specifically, Mass-EPA states that “the activated carbon injection technology appears to be promising” (Ex. 1009, 35) and that

[i]ncreased removal of mercury from gas has been demonstrated by co-injection of activated carbon and calcium-based sorbents in spray dryer adsorber systems in full-scale coal-fired power plants.

Id. at 32. Thus the evidence suggests that Petitioner’s combination of Vosteen589 with Starns and Mass-EPA was “the mere application of a

known technique to a piece of prior art ready for the improvement.” *KSR*, 550 U.S. at 401. And, “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond that person’s skill.” *Id.* Patent Owner does not allege that the combination was beyond the skill-set of the skilled artisan at the time of invention. *See generally* Prelim. Resp. Thus, Petitioner has provided sufficient reasoning with rational underpinnings to explain why a person of ordinary skill in the art would have modified the teachings of the applied references. *See KSR*, 550 U.S. at 418.

We acknowledge but are not convinced by Patent Owner’s arguments to the contrary. The Supreme Court has explained that “the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418. And further, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416. “If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.” *Id.* at 417. Moreover, an “[e]xpress suggestion to substitute one equivalent for another need not be present to render such substitution obvious.” *In re Fout*, 675 F.2d 297, 301 (CCPA 1982). Here, as detailed above, it appears that activated carbon injection is a known substitute that may be implemented as an alternative to activated carbon in a fixed form, *i.e.*, coated on a fabric filter.

Furthermore, to the extent that any portions of Dr. Niska's testimony may be contradictory, Patent Owner will have the opportunity to test the veracity of Dr. Niska's opinions over the course of trial. *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 595 (1993) ("Vigorous cross examination [and] presentation of contrary evidence . . . are the traditional and appropriate means of attacking shaky but admissible evidence."). We also find unpersuasive Patent Owner's argument that the Examiner ultimately allowed the claims of the '114 patent after initially rejecting the claims on a similar basis. Prelim. Resp. 14. That issue is best raised and resolved through the Interim Process Memorandum involving a bifurcated procedure for considering discretionary issues 35 U.S.C. § 325. *See* USPTO Memorandum, Interim Process for PTAB Workload Management (March 26, 2025), <https://uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt-20250326.pdf>.

Accordingly, we are persuaded Petitioner has sufficiently shown, at this stage of the proceeding, that the skilled artisan would have had a reason to combine Vosteen589 with either of Starns or Mass-EPA with a reasonable expectation of success in the combination.

Having determined that Petitioner satisfies the threshold showing under 35 U.S.C. § 314(a) for institution of trial with respect to at least one challenged claim of the '114 patent, we order that trial shall proceed on all claims and all challenged grounds. *SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 359 (2018) ("The agency cannot curate the claims at issue but must decide them all."); 37 C.F.R. § 42.108(a) ("When instituting . . . review, the Board

will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

5. *Remaining Claims*

Petitioner also alleges that the subject matter of claims 1–24 and 26–30 is also rendered obvious by the combination of Vosteen589 with either of Starns or Mass-EPA. Pet. 35–63. Patent Owner does not separately address claims 1–24 and 26–30. *See generally* Prelim. Resp. We have reviewed the information Petitioner provides—including Petitioner’s contentions and the relevant portions of the Niksa Declaration—and determine that Petitioner’s arguments and evidence are adequately supported for institution purposes.

E. Challenges Based on Downs-Boiler

Petitioner asserts that claims 23, 25–27, and 30 are anticipated by Downs-Boiler (Ground 3), that claims 1–8 and 12–30 would have been obvious over the combination of Downs-Boiler and Starns (Ground 4), and that claims 1–30 would have been obvious over the combination of Downs-Boiler and Mass-EPA (Ground 5). Pet. 10.

1. *Downs-Boiler (Ex. 1006)*

Downs-Boiler is a patent application publication titled “Bromine Addition for the Improved Removal of Mercury from Flue Gas.” Ex. 1006, code (54). Downs-Boiler explains that bromine-containing compounds, “added to the coal, or to the boiler combustion furnace, are used to enhance the oxidation of mercury, thereby enhancing the overall removal of mercury in downstream pollution control devices.” *Id.* at code (57).

Downs-Boiler’s Figure 2 is reproduced below:

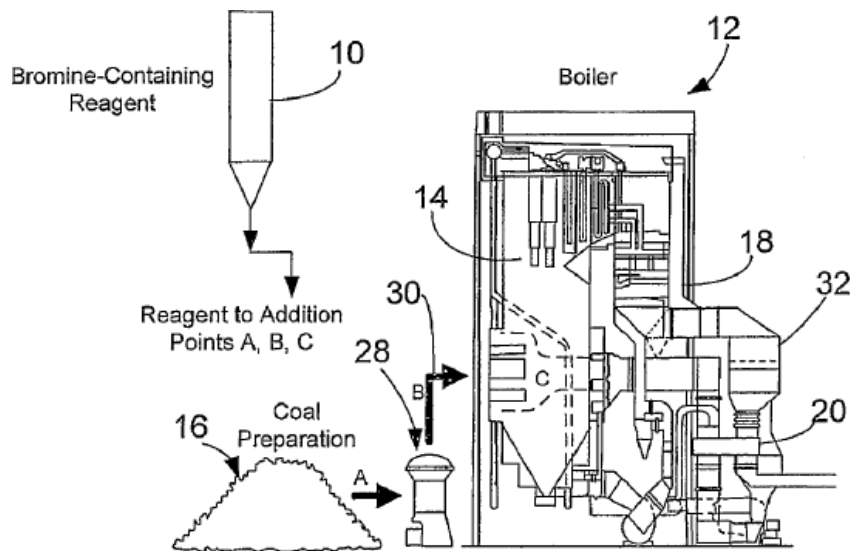


FIG. 2

Figure 2 shows adding bromine to improve mercury removal from flue gases. *Id.* ¶ 10. Downs-Boiler discloses that bromine-containing reagent 10 is added to boiler 12 of combustion furnace 14 “either directly or by premixing with the incoming coal 16.” *Id.* ¶ 15. Downs-Boiler describes the use of an aqueous solution of calcium bromide for injection into the combustion chamber 14, and the use of HBr or Br₂ as the bromine-containing reagent 10. *Id.* ¶¶ 18, 21. Downs-Boiler also discloses “powdered activated carbon (PAC)” as a sorbent, and describes “downstream pollution control systems such as wet 22 and SDA 24 FGD systems, and PAC injection systems.” *Id.* ¶¶ 15, 25. Downs-Boiler states that “experimental results indicate that bromine addition also results in an increased fraction of particulate-bound mercury.” *Id.* ¶ 15.

2. *Availability of Downs-Boiler as Prior Art*

Petitioner asserts that Downs-Boiler is prior art under pre-AIA 35 U.S.C. § 102(e). Pet. 16 (table indicating that Vosteen was “[f]iled 3/21/2005, claiming priority to 3/22/2004”); 64 (asserting that Downs-Boiler is prior art, “with a priority date of March 22, 2004, when 60/555,353,” the “Downs-Boiler Provisional” was filed (Ex. 1007), citing *Dynamic Drinkware*, 800 F.3d 1375, 1378 (Fed. Cir. 2015); *Amgen Inc. v. Sanofi*, 872 F.3d 1367, 1380 (Fed. Cir. 2017) (finding that *Dynamic* applies to published patent applications). Petitioner argues that the “disclosure of Downs-Boiler is supported by Downs-Boiler-Provisional, as illustrated in a redline between the two (Ex1032).” *Id.* (citing Ex. 1002 ¶¶ 213–215, 220). Petitioner also identifies where in the Downs-Boiler Provisional the elements of claim 1 of Downs-Boiler can be found. *Id.* (citing Ex. 1002 ¶¶ 221, 240–249). Petitioner points out that the “Board previously found that Downs-Boiler qualifies as prior art back to March 22, 2004.” *Id.* (citing Ex. 1026, 84–85, 96).

Patent Owner argues that “the inventors actually reduced the claimed invention to practice by at least September 2003.” Prelim. Resp. 24. Thus, Patent Owner argues, Petitioner “failed to meet [its] burden and the Board should deny institution. *Id.* Patent Owner also argues that the “inventors of the ’114 Patent have testified that they conceived of the invention at least by August 2002.” *Id.* at 25 (citing Ex. 2018). According to Patent Owner, the August 2002 conception and September 2023 reduction to practice “dates are corroborated by contemporaneous meeting presentations, testing

logbooks, and post-testing reports.” *Id.* (citing Exs. 2013–2015, 2017, 2024–2033).

Patent Owner further explains that “[i]nventor John Pavlish has testified that the ’114 technology was developed by the inventors as part of a research project into mercury capture at the EERC” and that his testimony “is corroborated by slides from that kickoff meeting that identify their plan to test various additives and sorbents.” *Id.* at 26 (citing Ex. 2018 ¶ 19; Ex. 2029, Ex. 2030). Patent Owner states that “[a]fter receiving DOE funding, the inventors were able to test various sorbents and additives at the EERC’s Pilot Test Combustor (‘PTC’).” *Id.* at 26–27 (citing Ex. 2018 ¶¶ 11–14, 16). According to Patent Owner, “[t]hese test results were reported to the DOE” and “[b]y August 2002, they had conceived of using bromine as the pre-combustion additive.” *Id.* at 27 (citing Ex. 2032; Ex. 2018 ¶¶ 25–30). Patent Owner asserts that “[t]his is corroborated by the ‘research ideas’ file that Mr. Pavlish maintained.” *Id.* at 27–28 (citing Ex. 2015, 2, 3). Patent Owner states that “[t]he metadata for this file indicates that it was last modified on August 30, 2002.” *Id.*

Patent Owner asserts that after the EERC obtained funding for further rounds of PTC testing, “the inventors reduced the claims of the ’114 patent to practice by performing tests using sodium bromide as the pre-combustion chamber additive and activated carbon as a post-combustion sorbent,” during tests conducted in September 2003, December 2003, and February 2004. *Id.* at 29 (citing Ex. 2018 ¶ 24, Claim chart exhibit). Patent Owner further asserts that “[t]hese tests were described in reports provided to the DOE.” *Id.* at 29–30 (citing Ex. 2012, 10, 11; Exs. 2013, 2014; Ex. 2018

¶¶ 41–42). Patent Owner contends that “[t]hese tests were also recorded in logbooks maintained by the EERC.” *Id.* at 30–32 (citing Ex. 2017; Ex. 2018 ¶¶ 31–39; Ex. 2012; Ex. 2004, 292:9–293:22). According to Patent Owner, “Inventor John Pavlish has described similar documentation for the December 2003 and February 2004 tests.” *Id.* at 33 (citing Ex. 2018 ¶¶ 31–49). Patent Owner argues, “Inventor John Pavlish further explained the results at trial” and that the reduction to practice is confirmed by testimony from all three inventors. *Id.* at 33–34 (citing Ex. 2004, 260:5–20; Ex. 2018). Patent Owner states that it provides “a summary of evidence on an element-by-element basis” for claims 1–4 and the remaining claims “are reflected in the inventors’ testing for the same reasons described above with respect to claims 1–4.” *Id.* at 34–56 (citing Ex. 2018).

Petitioner’s Preliminary Reply offers several arguments in response to Patent Owner’s argument that Downs-Boiler is not prior art. Prelim. Reply 9. First, Petitioner argues that Patent Owner “cannot swear behind Downs-Boiler because the ’114 Patent is a post-AIA patent with a 2018 priority date.” *Id.* at 10 (citing Pet. 16). Petitioner further argues, Patent Owner “has not produced evidence that the ’114 Patent claims are entitled to a pre-AIA effective filing date, or that the claims have written-description support through a chain of two CIPs and three other applications.” *Id.* at 11 (citing Ex. 1004). Second, Petitioner contends that even if Patent Owner “could attempt to swear behind Downs-Boiler, it has failed to do so.” *Id.* Petitioner explains that “the only support for the August 2002 date is an uncorroborated declaration from its CTO and SVP, John Pavlish . . . discussing a hodgepodge of ‘research ideas’ from others that Mr. Pavlish

‘had compiled.’” *Id.* (citing (Ex. 2018 ¶¶ 25–30; Ex. 2015). Petitioner further states that Patent Owner “does not include a claim chart, or any other evidence, showing conception of *each* element of the Challenged Claims.” *Id.* at 11–12. Instead, Petitioner argues, Patent Owner’s three-page write-up “fails to describe the ‘specific, settled idea, [the] particular solution to the problem at hand’ required for conception, and is ‘just a general goal or research plan he hopes to pursue.’” *Id.* at 12 (citing Prelim. Resp. 26–28; *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994)). Petitioner further argues Patent Owner “does not articulate any diligence related to post-August 2002 reduction to practice.” *Id.* at 12 (citing IPR2020-00834, Paper 18, 32–33).

Petitioner also argues that there is no evidence of early actual reduction to practice. *Id.* First, Petitioner argues that Patent Owner does not address the full scope of the claims. *Id.* Petitioner argues that Patent Owner’s assertions are “based on unwitnessed and incomplete laboratory notebooks and reports.” *Id.* at 12–13 (citing Prelim. Resp. 29). Petitioner also argues that even if some unidentified individuals had started a sodium bromide feeder, actual reduction to practice must “me[e]t all the limitations of the claim.” *Id.* at 13 (citing Prelim. Resp. 31; *In re Steed*, 802 F.3d 1311, 1318 (Fed. Cir. 2015). Petitioner argues that Patent Owner “fails to provide ‘independent evidence corroborating the inventor’s testimony’ for multiple claim limitations, such as: (i) ‘combustion chamber comprises added Br₂, HBr, Br-, or a combination thereof’; (ii) ‘coal that comprises’ these species; and (iii) ‘mercury-containing gas comprises’ these species.” *Id.* Petitioner argues that “[d]isclosure of one species (sodium bromide, NaBr) in the

notebook does not demonstrate possession of the undisclosed ‘HBr’ or ‘Br₂.’” *Id.* Finally, Petitioner argues that Patent Owner “ignores the vast majority of Challenged Claims, which alone justifies institution.” *Id.* at 14. And at a minimum, Petitioner argues, further development of the record is required. *Id.*

To remove a patent as a prior art reference, the record must establish either (1) a conception and reduction to practice before the filing date of the patent or (2) a conception before the filing date of the patent combined with diligence and reduction to practice after that date. *See Taurus IP, LLC v. DaimlerChrysler Corp.*, 726 F.3d 1306, 1323 (Fed. Cir. 2013); 37 C.F.R. § 1.131(b).¹³

“Conception exists when a definite and permanent idea of an operative invention, including every feature of the subject matter sought to be patented, is known.” *Sewall v. Walters*, 21 F.3d 411, 415 (Fed.

¹³ Patent Owner contends that it provided evidence relating to conception and diligence, and both parties provide arguments regarding the sufficiency of such evidence. *See* Prelim. Reply 11–12; Prelim. Sur-reply 12. However, the latest date on which Patent Owner asserts a reduction to practice predates the date Petitioner identifies as Downs-Boiler’s priority date. Prelim. Resp. 29 (“During tests conducted in September 2003, December 2003, and February 2004, the inventors reduced the claims of the ’114 Patent to practice by performing tests using sodium bromide as the pre-combustion chamber additive and activated carbon as a post-combustion sorbent.”); Pet. 16 (identifying March 22, 2004 as Downs Boiler’s priority date). And Patent Owner does not appear to assert conception coupled with diligence to an actual or constructive reduction to practice *after* Downs-Boiler’s priority date. Accordingly, we do not analyze the sufficiency of Patent Owner’s purported evidence of conception and diligence.

Cir. 1994). Furthermore, the “conception analysis necessarily turns on the inventor’s ability to describe his invention with particularity. Until he can do so, he cannot prove possession of the complete mental picture of the invention.” *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994). Objective evidence that corroborates an inventor’s testimony regarding the conception of the invention is required “because of the danger in post-hoc rationales by an inventor claiming priority.” *Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1065 (Fed. Cir. 2005). The sufficiency of corroboration is determined according to a “rule of reason.” *Price v. Symsek*, 988 F.2d 1187, 1195 (Fed. Cir. 1993). Under the rule of reason, “all pertinent evidence is examined in order to determine whether the inventor’s story is credible.” *Fleming v. Escort Inc.*, 774 F.3d 1371, 1377 (Fed. Cir. 2014) (quoting *Sandt Tech., Ltd. v. Resco Metal & Plastics Corp.*, 264 F.3d 1344, 1350 (Fed. Cir. 2001)).

To establish an actual reduction to practice, as opposed to the constructive reduction to practice that occurs when a patent application is filed, a party must establish that: (1) the inventor constructed an embodiment or performed a process that satisfies every element of the claim at issue; and (2) the inventor determined that the invention would work for its intended purpose. *E.I. du Pont De Nemours & Co. v. Unifrax I LLC*, 921 F.3d 1060, 1075 (Fed. Cir. 2019). The same requirement for evidence that corroborates inventor testimony on conception under the rule of reason also applies to the reduction to practice determination. *Id.* at 1076. To demonstrate diligence, a patent owner “must show there was *reasonably continuous* diligence”

throughout the critical period. *Perfect Surgical Techniques, Inc. v. Olympus Am., Inc.*, 841 F.3d 1004, 1009 (Fed. Cir. 2016).

Petitioner bears the burden of persuasion that the challenged claims are unpatentable, which includes the burden of establishing that any reference upon which it relies constitutes prior art under 35 U.S.C. § 102. *See* 35 U.S.C. § 316(e); *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576 (Fed. Cir. 1996) (holding that the challenger “bore the burden of persuasion . . . on all issues relating to the status of [the asserted reference] as prior art”). However, because Petitioner initially offered up the prior art references, which qualify on their face as prior art, into evidence, Patent Owner bears the subsequent procedural burden of producing evidence antedating the prior art references. *See Dynamic Drinkware*, 800 F.3d at 1378–80; *Magnum Oil*, 829 F.3d at 1375. Although the burden of production can be a shifting burden, we note that the burden of persuasion is on Petitioner to ultimately prove “unpatentability by a preponderance of the evidence,” and that this burden never shifts to Patent Owner. *Dynamic Drinkware*, 800 F.3d at 1378.

Petitioner has come forward with evidence to support its assertion that the prior art references are in fact prior art. *See* Pet. 16, 64. Patent Owner has come forward with evidence and argument that the proffered prior art references are not, in fact, prior art, due to the asserted prior conception, reduction to practice, and diligence on the part of the inventors. *See* Prelim. Resp. 24–56; Prelim. Sur-reply 10–12. However, on this record and at this preliminary stage, Patent Owner does not persuade us that the evidence and arguments it has produced warrant denial of institution.

As an initial matter, we agree with Petitioner that the issue of whether Patent Owner conceived and reduced the claimed method to practice is best reserved for trial because Petitioner has had no opportunity to depose Patent Owner's declarants. Prelim. Sur-reply 14. Patent Owner argues, "while Petitioners claim that they have not had a chance to depose the inventors, that ignores the fact that counsel for their indemnitors and real-parties-in-interest did have that chance." *Id.* This argument presupposes that we agree with Patent Owner on its real-party-in interest/privity argument. For the reasons discussed *infra*, we Patent Owner's arguments on this point are not persuasive. Further, the Delaware lawsuit involved a different patent and, according to Petitioner, "the Delaware defendants did not even present evidence of invalidity at trial." Prelim. Reply 4–5 n.2, 11.

Moreover, at this preliminary stage, Patent Owner does not sufficiently explain how disclosure of sodium bromide (NaBr) in its antedating documents supports the full scope of what is claimed, i.e., "Br₂, HBR, a bromide compound, or a combination thereof." Patent Owner argues that the "inventors clearly appreciated that other species of bromines/bromides 'would behave similarly' to NaBr," pointing to testimony and discussion in the challenged patent on how the claimed method works. Prelim Sur-reply 14 (citing Ex. 2018, 9–11, 15–16;¹⁴ Ex. 2004, 246:13–259:12; Ex. 1001, 29:21–29). But the evidence Patent Owner identifies does not directly address the issue of why the species

¹⁴ Patent Owner's citation to Exhibit 2018 appears to use the pagination added by Patent Owner. The panel's preference would be for the parties to cite to declaration evidence by paragraph number.

“NaBr” supports the claimed “HBr” and “Br₂” species or the “bromide compound” genus. And, Patent Owner’s assertion that “other species of bromides/bromines ‘would behave similarly’” rests largely on attorney argument, which may be at odds with the testimony of inventor Olson. *See* Prelim. Reply 13 (asserting that lead inventor Dr. Olson testified in the Delaware litigation that it would be “absolutely stupid” to add “Br₂ in the combustion chamber or upstream of the combustion chamber”);¹⁵ *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989) (“Attorneys’ argument is no substitute for evidence.”); *In re Pearson*, 494 F.2d 1399, 1405 (CCPA 1974).

Finally, we note that Patent Owner’s attempt to antedate Downs-Boiler presupposes that pre-AIA 35 U.S.C. § 102 applies. Because we have already determined that Petitioner has adduced sufficient evidence that Downs-Boiler is prior art to support institution, we need not determine whether pre- or post-AIA 35 U.S.C. § 102 applies. Nonetheless, the parties have devoted substantial briefing to this issue, and to guide the parties going forward, we provide our views on Petitioner’s argument that pre-AIA 35 U.S.C. § 102 does not apply. Prelim. Reply 10.

On this preliminary record, Petitioner has adduced sufficient evidence on the issue of whether Downs-Boiler qualifies as prior art to support institution. This shifts the burden of production to Patent Owner. Where, as here, the priority chain for the challenged patent includes multiple

¹⁵ We do not rely on this purported testimony in reaching our decision because Petitioner does not provide a citation for it. We point it out here to guide the parties going forward.

continuation-in-part applications and a provisional application (*see* Ex. 1004), and where Patent Owner seeks to swear behind the prior art, that burden necessarily includes producing evidence that pre-AIA § 102 applies.

Patent Owner argues that Petitioner’s showing does not shift the burden of production to Patent Owner to produce evidence that the challenged patent is entitled to priority because Petitioner has “forfeited” this issue by “accept[ing] the filing date of the provisional application as a priority date for the ’114 patent.” Prelim. Sur-reply 11 (citing Paper 2 (Petitioner’s Ranking of Petitions)). This argument is not persuasive because we do not interpret the Petition’s initial reliance on the filing date of the provisional application as a waiver of the right to challenge that filing date in the event that, as here, Patent Owner attempts to antedate the prior art relied upon in the Petition.

Patent Owner contends that Petitioner raised this issue as a new argument in Petitioner’s Reply. Prelim. Sur-reply 10.¹⁶ This argument is not persuasive because Petitioner raised this argument in its Preliminary Reply in response to Patent Owner’s assertion of a prior invention date in their Preliminary Response. Prelim. Resp. 24–25, 34. Furthermore, the Petition expressly states that if Patent Owner attempts to swear behind any asserted references, “Petitioner may rebut such arguments . . . , including [by

¹⁶ Patent Owner also argues that Petitioner’s argument exceeds the scope of authorized briefing. Prelim. Sur-reply 10. This issue is moot because, as discussed above, we have already determined that Petitioner’s showing is sufficient even under pre-AIA 35 U.S.C. § 102. As discussed above, our discussion of this issue is intended to provide guidance to the parties going forward, not to support institution.

arguing] that the '114 Patent cannot claim priority to any pre-AIA parent application and cannot swear behind references.” Pet. 16. Patent Owner’s Sur-reply refers to and invites us to consider the priority date arguments raised and evidence presented in IPR2025-00278. In that proceeding, the parties provide extensive argument regarding whether the challenged claims are entitled to priority. And in our Institution Decision, we analyze this priority date issue in depth based on the parties’ arguments and evidence presented in that proceeding. We are aware of the potential problems that could arise if we were to ignore or fail to address a priority date issue in this case, when the same potentially dispositive issue has been raised and analyzed in IPR2020-00832 concerning the same patent and the same priority date evidence. Accordingly, the parties are encouraged to try to maintain consistent records as between cases, at least with respect to critical evidence, to help us to avoid the potential for inconsistent results. More broadly, in the event Patent Owner maintains its position that Downs-Broiler is not prior art because the inventors conceived and reduced the claimed method to practice before Downs-Boiler, that parties are encouraged to further develop the record on whether AIA applies.

3. *Independent Claim 25*

Petitioner focuses its allegations on claim 25, because “the other independent claims copy its limitations.” Pet. 65. Petitioner alleges that Downs-Boiler¹⁷ discloses each of the limitations in claim 25. Petitioner

¹⁷ Petitioner also provides “[p]arallel citations for written-description support in Downs-Boiler-Provisional (Ex. 1007).” *Id.*

further alleges that Downs-Boiler, in combination with either of Starns or Mass-EPA, describes a “mercury-containing gas compris[ing] a halogen or halide promoter comprising HBr, Br₂, or combinations thereof” and “contacting . . . the mercury-containing gas with the sorbent to form a mercury/sorbent combination.” *Id.* at 73–75. Regarding the preamble of claim 25, Petitioner asserts that Downs-Boiler discloses “removal of mercury” which “refers to separating mercury from mercury containing gas.” *Id.* at 65 (citing Ex. 1006 ¶¶ 4, 18; Ex. 1007 ¶¶ 5, 21; Ex. 1002 ¶ 434). Claim 25 further requires “combusting coal in a combustion chamber, to provide the mercury-containing gas” which Petitioner contends is suggested by Downs-Boiler. In particular, Petitioner asserts “Downs-Boiler states [that] ‘[m]ercury appears in coal combustion flue gasses in both solid and gas phases’” and that “Downs-Boiler discusses combusting coal throughout.” *Id.* at 66 (citing Ex. 1006 ¶¶ 1, 2, 10–15, 20, Figs. 2, 4–6; Ex. 1007 ¶¶ 2–3, 9, 12–16, 18, 23, Figs. 2–6; Ex. 1002 ¶¶ 435–436). Regarding the limitation “the coal comprises added Br₂, HBr, a bromide compound, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added Br₂, HBr, a bromide compound, or a combination thereof, or a combination thereof,” Petitioner argues that Downs-Boiler discloses adding “bromine-containing reagents, including ‘alkali metal and alkaline earth metal bromides, hydrogen bromide (HBr) or bromine (Br₂),’ and ‘an aqueous solution of calcium bromide (CaBr₂)’” upstream of the combustion chamber. *Id.* (citing Ex. 1006 ¶¶ 7, 15, 18–19, 21, Fig. 2; Ex. 1007 ¶¶ 9, 18, 21–22, 24, Fig. 2; Ex. 1002 ¶¶ 437–443). Downs-Boiler describes the addition of bromine-containing additives

at several locations including spraying (1) onto the crushed coal before the coal is pulverized for combustion, (2) the pulverized coal before the combustion chamber, and (3) directly into the combustion chamber. *Id.* at 67 (citing Ex. 1006 ¶¶ 19, 22, Fig. 2; Ex. 1007 ¶¶ 22, 25, Fig. 2; Ex. 1002 ¶¶ 437–443). Petitioner further contends that Downs-Boiler “discloses ‘injection of a carbonaceous sorbent (e.g., powdered activated carbon, or PAC) into the flue gas upstream of the dust collector to adsorb vapor-phase mercury’” and that “‘PAC injection systems’ are a component of ‘downstream pollution control systems,’ as they are downstream of the combustion chamber.” *Id.* at 68 (citing Ex. 1006 ¶¶ 4, 15; Ex. 1007 ¶¶ 5, 18; Ex. 1002 ¶¶ 444–445). Lastly, Petitioner asserts that Downs-Boiler discloses “separating the mercury/sorbent composition” where it describes that the “activated-carbon ‘sorbent, and its burden of adsorbed mercury, are subsequently removed from the flue gases in a downstream particulate collector.’” *Id.* at 69 (citing Ex. 1006 ¶¶ 18–19, 21–22, Fig. 2; Ex. 1007 ¶¶ 21–22, 24–25, Fig. 2; Ex. 1002 ¶¶ 450–451).

Petitioner’s also asserts that the limitations describes “mercury-containing gas compris[ing] a halogen or halide promoter comprising HBr, Br₂, or combinations thereof” and “contacting . . . the mercury-containing gas with the sorbent to form a mercury/sorbent combination” are met by either of Starns or Mass-EPA. For example, Petitioner alleges that Starns describes that its flue gas “is typically at a temperature of 290°F (143°C), so Br₂ and HBr would be present in the gas phase in mercury-containing gas” and that the “gas-phase mercury in the flue gas contacts the sorbent and attaches to its surface.” *Id.* at 74–75 (citing Ex. 1008 ¶¶ 2, 10; Ex. 1002

¶ 478). Similarly, Petitioner argues that Mass-EPA teaches its flue gas “ranges from 140–160°C after the air heater or 350–450°C (before the air heater), so Br₂ and HBr would be present in the gas phase in mercury-containing gas” and the “sorber particles . . . contact the Hg in the flue gas.” *Id.* (citing Ex. 1009, 21 n.25, 26, 33; Ex. 1002 ¶¶ 478, 483). Petitioner argues that the skilled artisan would have had reason to combine the teachings of to supply additional details regarding how to implement the PAC injection system of Downs-Boiler and because the combination “represents combining prior art elements (activated-carbon sorber in Downs-Boiler and Starns/Mass-EPA) according to known methods (injection into flue gas in Downs Boiler and Starns/Mass-EPA) to yield predictable results (mercury removal).” *Id.* at 72–73 (citing Ex. 1002 ¶¶ 436–464).

Patent Owner does not address Petitioner’s arguments regarding the claims challenged under this ground, aside from arguing the priority date of invention for the ’114 patent, as discussed below. Prelim. Resp. 24–56. Based on the preliminary record before us, we find that Petitioner’s arguments and evidence are sufficient to show a reasonable likelihood Petitioner would prevail in proving unpatentability of claim 1.

4. *Remaining Claims*

Petitioner also alleges that the subject matter of claims 1–24 and 26–30 is also rendered obvious by the combination of Downs-Boiler alone, or in combination with either of Starns or Mass-EPA. Pet. 69–98. Patent Owner does not separately address claims 1–24 and 26–30. *See generally* Prelim. Resp. We have reviewed the information Petitioner provides—including

Petitioner's contentions and the relevant portions of the Niksa Declaration—and determine that Petitioner's arguments and evidence are adequately supported for institution purposes.

VI. CONCLUSION

For the reasons above, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail with respect to challenged claims 1–30 of the '114 patent. Accordingly, we institute an *inter partes* review of the '114 patent.

VII. ORDER

For the foregoing reasons, it is hereby

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–30 of the '114 patent is hereby instituted with respect to all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this Decision; and

FURTHER ORDERED that, no later than fourteen days after the issuance of this decision, the parties may file a joint motion to seal, explaining why this decision should remain under seal, and including a redacted version of this decision that can be made publicly available;

FURTHER ORDERED that the present decision shall remain under seal until any joint motion to seal the present decision is resolved; and

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FURTHER ORDERED that the present decision shall be made public if, after the expiration of time for the parties to file a joint motion to seal, no such motion has been filed.

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