

CONFIDENTIAL NON-PUBLIC VERSION

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.,
Petitioners,

v.

BIRCHTECH CORP.,
Patent Owner.

IPR2025-00422
Patent 10,668,430 B2

Before KRISTINA M. KALAN, ZHENYU YANG, and
AVELYN M. ROSS, *Administrative Patent Judges*.

YANG, *Administrative Patent Judge*.

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

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I. INTRODUCTION

Berkshire Hathaway Energy Company (“Berkshire”), Interstate Power & Light Company (“IPL”), MidAmerican Energy Company (“MidAmerican”), PacifiCorp, WEC Energy Group, Inc. (“WEC”), and Wisconsin Power & Light Company (“WPL”) (collectively, “Petitioners”)¹ filed a Petition (Paper 1, “Pet.”), seeking *inter partes* review of claims 1–4 and 6–29 of U.S. Patent No. 10,668,430 B2 (Ex. 1001, “the ’430 patent”). Birchtech Corp. (“Patent Owner”), formerly known as Midwest Energy Emissions Corp. (“ME2C”) (Paper 9, 1²), filed a Preliminary Response. Paper 19 (“Prelim. Resp.”).³ With our authorization (Ex. 3001), Petitioners filed a Reply to the Preliminary Response (Paper 22, “Reply”), and Patent Owner filed a Sur-reply to Petitioners’ Reply (Paper 24, “Sur-reply”).

We have authority under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

¹ IPL and WPL subsequently settled their dispute with Patent Owner and have been terminated from this proceeding. Paper 29. Accordingly, “Petitioners” as used herein refers only to the remaining Petitioners, namely, Berkshire, MidAmerican, PacifiCorp, and WEC.

² All but the cover page of Paper 9 are numbered “Page 2.” We consider the first page after the cover page as page number 1.

³ Patent Owner and Petitioners also filed briefs, arguing for and against discretionary denial, respectively. Papers 16, 20. The Acting Director determined that discretionary denial was not appropriate and referred the Petition to the Board. Paper 21.

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For the reasons provided below, we determine Petitioners have satisfied the threshold requirement set forth in 35 U.S.C. § 314(a). We institute *inter partes* review of all challenged claims based on all the grounds raised in the Petition.

A. Real Parties in Interest

Petitioners identify Berkshire, IPL, MidAmerican, PacifiCorp, WEC, and WPL, 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 real parties in interest. Pet. 1–2.

Patent Owner identifies “MES, Inc.” as the real party in interest. Paper 9, 1.

B. Related Matters

Petitioners filed a concurrent petition (IPR2025-00423), seeking *inter partes* review of the same claims challenged in this proceeding.⁴ 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”);

⁴ Petitioners filed an explanation regarding the necessity of multiple petitions. Paper 2. Petitioners request that, if needed, we consider this Petition before we consider the Petition in IPR2025-00423. *Id.* at 3. Patent Owner does not challenge that multiple petitions are necessary. *See generally* Prelim. Resp.

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

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

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

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

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. 5–6; Paper 9, 1–2.

Petitioners previously filed other petitions for *inter partes* review, challenging two other patents owned by Patent Owner. Pet. 3. Those petitions are: IPR2025-00274 and IPR2025-00278, challenging claims of U.S. Patent No. 10,343,114 (“the ’114 patent”); and IPR2025-00280 and IPR2025-00281, challenging claims of U.S. Patent No. 10,596,517. *Id.* The Board instituted trial in those proceedings.

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Petitioners also bring to our attention several *inter partes* review proceedings, with petitions filed by other entities, including: IPR2020-00832 and IPR2020-00834, challenging claims of the '114 patent; and IPR2020-00926 and IPR2020-00928, challenging claims of a parent patent of the '430 patent. Pet. 3–5. According to Petitioners, the Board granted institution but terminated those proceedings because the parties settled. *Id.*

C. *The '430 Patent*

The '430 patent “relates to methods and materials for the removal of pollutants from flue gas or product gas from a gasification system. In particular, mercury is removed from gas streams generated during the burning or gasification of fossil fuels by highly reactive regenerable sorbents.” Ex. 1001, 1:40–44.

The '430 patent states that

[t]he combustion and gasification of fossil fuel such as coal generates flue gas that contains mercury and other trace elements that originate from the fuel. The release of the mercury (and other pollutants) to the environment must be controlled by use of sorbents, scrubbers, filters, precipitators, and other removal technologies.

Id. at 1:46–51.

The '430 patent acknowledges that “[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 2:2–5. According to the '430 patent, however, because sorbents in the existing carbon injection systems are initially unreactive, they “must be used in large amounts, at high sorbent-to-mercury ratios, to

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effectively capture the mercury.” *Id.* at 2:23–29. Thus, “there remains a need for more economical and effective mercury removal technology.” *Id.* at 2:35–36.

The ’430 patent describes a halogen/halide promoted activated carbon sorbent that is highly effective for the removal of mercury from flue gas streams. *Id.* at 2:48–50. According to the ’430 patent, “[t]he sorbent comprises a new halide-modified carbon form containing a reactive compound produced by the reaction of bromine (or halide or other halogen) with the carbon.” *Id.* at 2:50–53.

The ’430 patent states that “[o]ptional secondary components and alkali may be added to further increase reactivity and mercury capacity,” and discloses 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 2:53–55, 3:32–35.

The ’430 patent provides a promoted carbon sorbent “comprising a base activated carbon that has reacted with a promoter selected from the group consisting of halides, halogens, and combinations thereof.” *Id.* at 2:62–65. In one embodiment, “the promoter is selected from the group consisting of Br₂, a Group V bromide, a Group VI bromide, and combinations thereof.” *Id.* at 4:3–5.

The ’430 patent states that its invention “provides for cost-effective removal of pollutants including mercury, using sorbent enhancement additives and/or highly reactive sorbents, with contact times of seconds (or less), and that may be regenerated and reused.” *Id.* at 2:37–40.

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D. Illustrative Claim

Independent claim 1 is illustrative of the claimed subject matter and 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 coal comprises an additive comprising Br₂, HBr, a bromide compound, or a combination thereof, wherein the additive is added to the coal before the coal enters the combustion chamber, or

the combustion chamber comprises an additive comprising Br₂, HBr, a bromide compound, or a combination thereof or a combination thereof;

injecting a sorbent comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;

contacting mercury in the mercury-containing gas with the sorbent; and

separating the sorbent contacted with the mercury from the mercury-containing gas.

Ex. 1001, 35:47–65.

E. Asserted Challenges to Patentability

Petitioners assert the following challenges to patentability:

Claims Challenged	35 U.S.C. §	Reference
1–4, 6–29	103(a)	Vosteen589, ⁵ Starns ⁶

⁵ US 2004/0013589 A1, published Jan. 22, 2004. Ex. 1005 (“Vosteen589”).

⁶ Starns, Travis, et al., *Full-Scale Test of Mercury Control with Sorbent Injection and an ESP at Wisconsin Electric’s Pleasant Prairie Power Plant*,

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Claims Challenged	35 U.S.C. §	Reference
1–4, 6–29	103(a)	Vosteen589, Mass-EPA ⁷
1–4, 6–9, 14–16, 18, 19, 22–28	102(e)	Downs-Boiler ⁸
1–4, 6–29	103(a)	Downs-Boiler, Starns
1–4, 6–29	103(a)	Downs-Boiler, Mass-EPA

In support of the unpatentability challenges, Petitioners rely on the Declaration of Stephen Niksa, Ph.D. (Ex. 1002).

II. WHETHER THE PETITION IS TIME-BARRED

Under 35 U.S.C. § 312(a)(2), we consider a petition only if it identifies all real parties in interest. In addition, “[a]n inter partes review may not be instituted if the petition requesting the proceeding is filed more than 1 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.” 35 U.S.C. § 315(b). Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b). *See, e.g., Ventex Co.*,

Session AE1-C, Paper No. 43249, AIR & WASTE MANAGEMENT’S ASSOCIATION’S 95TH ANNUAL CONFERENCE, June 23–27, 2002. Ex. 1008 (“Starns”).

⁷ Massachusetts Dept. 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/wp/daqc/files/mercfeas.pdf> and at <https://www.mass.gov/doc/evaluation-of-technologicaleconomic-feasibility-of-controlling-eliminating-mercuryemissions/download>. Ex. 1009 (“Mass-EPA”).

⁸ US 2008/0107579 A1, published May 8, 2008, Ex. 1006 (“Downs-Boiler”).

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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 (“CTPG”) 13 (2019), available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

“Courts invoke the terms ‘real party-in-interest’ and ‘privy’ 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

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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*, 897 F.3d at 1351.

The mere existence of some relationship between a petitioner and another entity, however, 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.”

WesternGeco LLC, 889 F.3d at 1319.

Patent Owner argues the Petition is time-barred because it fails to identify Talen and Chem-Mod, who were defendants in the Delaware Action,⁹ as real parties in interest. Prelim. Resp. 47–52. According to Patent Owner, “Petitioners are coal plant owners and/or operators with a close relationship to Delaware Defendants. Consequently, the clock for

⁹ 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.

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time-barring this Petition ran from the time Delaware Defendants were served in the Delaware Litigation.” Sur-reply 2.

As explained below, based on the current record, we determine that the Petition is not time-barred for failure to name all real parties in interest.

A. Petitioners who Purchase Coal from Chem-Mod

Patent Owner asserts that Petitioners Berkshire, MidAmerican, IPL, WPL, and 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. 49. In the Delaware Action, Patent Owner “asserted that this Chem-Mod Solution caused direct infringement at Petitioners’ power plants” and named Chem-Mod LLC and its various affiliates as defendants. *Id.* at 50.

Specifically, Patent Owner contends that “MidAmerican purchased refined coal from Chem-Mod sublicensees” and that Berkshire “owns and controls MidAmerican.” *Id.* at 50–51. Patent Owner alleges that “Wisconsin Public Service Corporation, the parent of Petitioner WEC, purchased refined coal from Chem-Mod LLC sublicensee Arbor Fuels Company, LLC.” *Id.* at 51. Patent Owner states that “[t]hese Petitioners have argued that Chem-Mod and its affiliates defended Patent Owner’s infringement claims and negotiated a license on their behalf.” *Id.* 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.” *Id.* at 52. According to Patent Owner, because Chem-Mod was a defendant in the Delaware Action, this Petition is time-barred. *Id.*

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Petitioners argue that neither the fact that “Chem-Mod and affiliates supplied refined coal to some Petitioners through agreements that expired in 2021,”¹⁰ nor the generic indemnity agreement provided by Chem-Mod to Berkshire, MidAmerican, and WEC, without more, is sufficient to establish Chem-Mod as a real party in interest or create privity. Reply 8–9.

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. 2037–2042 (discussed at Sur-reply 8–9).

We acknowledge, but disagree with, Patent Owner’s argument that the terms of the indemnity “specifically targeted” the activities at the “heart of

¹⁰ Petitioners assert 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.

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the alleged infringement.” Sur-reply 8. Rather, the indemnification language in these agreements appears to be standard and typical of supply agreements. *See* Ex. 2037, 26;¹¹ 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 party of interest in IPR2020-00832. Prelim. Resp. 51–52. This argument 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 contains insufficient evidence for us to determine the nature of such relationship.

¹¹ Exhibit 2037 is an agreement with WPL, who has recently been terminated from this *inter partes* review. *See* Paper 29. 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 IPL and WPL, who have been terminated from this proceeding.

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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 infringement claims and obtained a license on their behalf, at least for some periods of time.” 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

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WPL.¹² Accordingly, on the current record, Patent 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" (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 might be. Moreover, Patent Owner asserts that the power plant operators it sued in 2024, which include MidAmerican and WPL, "are not incorporated in Delaware and thus could not have been included in the Delaware Litigation" (Sur-reply 4), which suggests that their interest in the Delaware power plants at issue in the Delaware Action was not substantial.

Patent Owner does not point to any record evidence that suggests the parties to the Delaware Action adequately represented the Chem-Mod Purchasers' interests or that the Chem-Mod Purchasers controlled, directed, or funded the Delaware Action. *See generally* Prelim. Resp.; Sur-reply. Nor does Patent Owner suggest that the indemnified Petitioners are acting as a

¹² Petitioners contend that Patent Owner's "cited pleadings do not support its 'on their behalf' assertions. Rather, certain Petitioners argued that PO cannot pursue infringement claims against them, because PO granted a covenant-not-to-sue." Reply 6.

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proxy for Chem-Mod and its affiliates in this case. Thus, the relationship with Chem-Mod, its affiliates, and the indemnified 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, Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b), but the current record does not provide sufficient reason to doubt Petitioners’ assertion that Chem-Mod was not “funding this petition, advising on strategy for this petition, or exercising any control over Petitioners’ decision to file the petition (or the arguments included therein).” Pet. 2; *see also* Reply 1–2.

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 purchasers 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 Chem-Mod and the Chem-Mod Purchasers does not support that the Petition is time-barred.

B. PacifiCorp

Patent Owner identifies three reasons why it believes Talen is a real party in interest with respect to Petitioner PacifiCorp. Prelim. Resp. 48–49.

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

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the named operator of that power plant, Talen defended the lawsuit and settled the litigation.” *Id.*

The evidence supports Patent Owner’s argument that PacifiCorp is a co-owner of the Colstrip power plant. Ex. 1113, 1. However, PacifiCorp owns only a 10% interest in units 3 and 4 of the Colstrip plant. *Id.* Evidence shows that other owners of the remaining interest are Talen, NorthWestern Energy, Puget Sound Energy, and Portland General Electric. *Id.* Patent Owner does not allege, or identify evidence supporting, that PacifiCorp’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.; Sur-reply. Without more, we are not persuaded that PacifiCorp’s 10% ownership interest in the Colstrip plant supports Patent Owner’s argument that Colstrip co-owner, Talen, should have been named as a real party in interest.

Second, Patent Owner notes that “PacifiCorp has alleged that Talen negotiated that settlement agreement on its behalf and for the benefit of PacifiCorp.” Prelim. Resp. 49. Here, our analysis is complicated by the fact that the evidence Patent Owner cites in support of its position—PacifiCorp’s answer to the district court infringement suit—is heavily redacted.

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Paragraphs 54–60 of PacifiCorp’s Answer are representative and are reproduced below.

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

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

[REDACTED]
[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 PacifiCorp, 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 PacifiCorp’s answer cited by Patent Owner and cannot determine, for example, whether PacifiCorp is one of the Talen Released Parties or, if so, what the nature of the release is. *Id.*; *see also id.* at 95–100. Patent Owner, as a party to the Talen Agreement (*id.* at 95), presumably has this information in its possession. And, having filed suit against PacifiCorp for infringement of the ’430 patent (Ex. 2007), Patent Owner must not agree that Talen negotiated a

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license to the '430 patent on PacifiCorp's behalf.¹³ Without more, we are not persuaded that the allegations in PacifiCorp's Answer meaningfully support Patent Owner's argument that Colstrip's co-owner, Talen, should have been named as a real party in interest.

Third, Patent Owner asserts that "Talen specifically identified PacifiCorp as a real party in interest" in IPR2020-00832. Prelim. Resp. 48–49. In IPR2020-00832, Talen, "out of an abundance of caution," identified PacifiCorp, along with numerous other entities, as a "potential real party-in-interest." IPR2020-00832, Paper 3, 1–3. 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 panel in IPR2020-00832 recognized Talen's belief that PacifiCorp may be a real party in interest, but made no 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.

¹³ In its Preliminary Response, Patent Owner asserts that a license exists covering "activity at the Colstrip power plant" but not PacifiCorp's other plants. Prelim Resp. 49 n.23.

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In sum, Petitioners bear the burden of demonstrating compliance with 35 U.S.C. § 312(a)(2) and § 315(b), but the current record does not provide sufficient reason to doubt Petitioners' assertion that Talen was not "funding this petition, advising on strategy for this petition, or exercising any control over Petitioners' decision to file the petition (or the arguments included therein)." Pet. 2; *see also* Reply 1–2.

The current record supports that PacifiCorp and Talen are co-owners of the Colstrip power plant and that Patent Owner granted a license covering the Colstrip power plant. Ex. 1113, 1; Prelim Resp. 49 n.23. Without more, this relationship does not make Talen a real party in interest to this proceeding, nor does it support that PacifiCorp was in privity with Talen in the Delaware Action. Therefore, on this record, we determine that the relationship between the PacifiCorp and Talen does not support that the Petition is time-barred.

III. ANALYSIS OF ASSERTED GROUNDS

A. *Level of Ordinary Skill in the Art*

In determining 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). Furthermore, the prior art itself can reflect the appropriate level of ordinary skill in the art. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Petitioners assert that "[a] person of ordinary skill in the art ["POSITA"] would have at least a bachelor's degree in chemical

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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. 12 (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 Petitioners’ proposed definition of a POSITA because it is consistent with the skill level reflected in the disclosures of the ’430 patent and prior art. *See Okajima*, 261 F.3d at 1355 (the prior art may reflect an appropriate level of skill in the art).

B. *Claim Construction*

In an *inter partes* review, we construe a claim term “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R. § 42.100(b). Under that standard, the words of a claim “are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Claim terms need only be construed to the extent necessary to resolve the controversy. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011). On this record and for purposes of this Decision, we see no need to construe any claim term expressly.

C. *Alleged Obviousness over Vosteen589 and Starns or Mass-EPA*

Petitioners assert that claims 1–4 and 6–29 would have been obvious over Vosteen589 and Starns (Ground 1), and over Vosteen589 and

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Mass-EPA (Ground 2). Pet. 25–60. Based on this record, and for at least the following reasons, we determine Petitioners have established a reasonable likelihood that it would prevail in these assertions.

1. Asserted Prior Art

a. *Vosteen589*

Vosteen589 “relates to a process for removing mercury from flue gases of high-temperature plants, in particular power stations and waste incineration plants.” Ex. 1005 ¶ 1. Specifically, Vosteen589 states:

The 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/oven coal coke

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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.

b. Starns

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.” Ex. 1008, 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.

c. Mass-EPA

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

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affected power plants and caps emissions of CO₂ from the facilities.”
Ex. 1009, 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, n.25. 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.

2. Analysis

We focus our analysis on independent claim 1. Petitioners provide detailed analysis to support its argument that the combination of Vosteen589 and Starns (Ground 1) or the combination of Vosteen589 and Mass-EPA (Ground 2) teaches each limitation of claim 1. *Id.* at 30–35.

Petitioners argue that Vosteen589 discloses all of the limitations of claim 1 except for “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,” which Petitioners allege is taught by Starns and Mass-EPA. *Id.*

Patent Owner does not dispute Petitioners’ mapping of claim 1’s limitations to the asserted prior art. *See generally* Prelim. Resp. On this record, we find Petitioners’ analysis persuasive. *See* Pet. 30–35. Thus, there

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is a reasonable likelihood that the combination of Vosteen589 and Starns, or the combination of Vosteen589 and Mass-EPA, teaches each limitation of claim 1.

This, however, does not end our obviousness inquiry. A patent claim “composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). We still “must further consider the factual questions of whether a person of ordinary skill in the art would be motivated to combine those references, and whether in making that combination, a person of ordinary skill would have had a reasonable expectation of success.” *Dome Patent L.P. v. Lee*, 799 F.3d 1372, 1380 (Fed. Cir. 2015). Based on the current record, and for purposes of this Decision, we find Petitioners have shown sufficiently that “a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” See *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (citations omitted). We address the parties’ arguments below.

Petitioners argue that “Vosteen589 uses a dry-emission control system for the flue gas, which works based on the adsorption of ionic mercury compounds.” Pet. 26 (citing Ex. 1005 ¶¶ 7, 18, 19) (quotation marks omitted). Petitioners assert that Vosteen589 discloses “finely pulverulent slaked lime/activated carbon” sorbent. *Id.* (citing Ex. 1005 ¶ 19). Petitioners acknowledge that “[t]hough Vosteen589 discloses activated-carbon sorbent and particulate-control devices (e.g., ESPs), Vosteen589 does not fully

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disclose certain implementational details, such as how sorbent is introduced.” *Id.* Petitioners, however, argue that “Starns and Mass-EPA supply those details, including hardware and control processes.” *Id.*

According to Petitioners, “[a] POSITA would have been motivated to use activated-carbon injection (as in Starns and Mass-EPA) with Vosteen589, with reasonable expectation of success, because activated-carbon injection was well-known.” *Id.* Petitioners assert that “[e]ach 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 26–27 (citing Ex. 1002 ¶ 304).

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.” Prelim. Resp. 8. Patent Owner contends that “Petitioners offer no evidence to support their conclusion other than the fact that the references qualify as prior art,” for example, “activated carbon injection was well-known” in the art. *Id.* at 11 (emphasis omitted). According to Patent Owner, “Petitioners identify no problem to be solved in Vosteen or other reason as to why a POSITA would be motivated to modify Vosteen.” *Id.*

Patent Owner also argues that the testimony of Dr. Niksa, Petitioners’ declarant, “does not fill this gap.” *Id.* According to Patent Owner, Dr. Niksa’s testimony should be afforded little weight because it is inconsistent with his testimony in IPR2020-00834. *Id.* at 12. Lastly, Patent Owner asserts that during prosecution of the related ’114 patent, the examiner found that a

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POSITA would not have modified the prior art in the manner suggested by Petitioners. *Id.* at 13–14.

On this record, we find Petitioners have sufficiently shown that a POSITA would have had a reason to modify the teachings of Vosteen589 with either of Starns or Mass-EPA.

With respect to the combination of Vosteen589 and Starns, Petitioners rely on Starns for teaching hardware and control processes for “injecting activated carbon ahead of particle control devices (PCD) to remove mercury.” *Id.* at 32 (citing Ex. 1008, 2). Specifically, Starns teaches 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 33 (citing Ex. 1008, 2; Ex. 1002 ¶¶ 329, 333).

Petitioners assert that activated-carbon injection was well-known in the art. *Id.* at 26 (citing Ex. 1001, 2:5–12, 7:41–48, 28:9–22; Ex. 1095, 114:21–25; Ex. 1096, 41:5–9; Ex. 1097, 210:4–18). Petitioners point to Starns for disclosing 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.” *Id.* at 27 (citing Ex. 1008, 2).

According to Petitioners, a POSITA would have modified Vosteen589’s system to include Starns’s activated charcoal injection 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

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predictable results of removing mercury.” *Id.* at 28 (citing Ex. 1002 ¶¶ 306–309). Petitioners further explain that this combination results in “improved mercury removal (as compared to bare activated carbon) with lowered sorbent costs.” *Id.* at 27 (citing Ex. 1002 ¶ 304).

Similarly, Petitioners assert that “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,” because activated carbon injection “was ready for commercialization by 2002, years before the ’430 Patent’s earliest possible priority date.” *Id.* at 29 (citing Ex. 1002 ¶¶ 310–314). As support, Petitioners point to Mass-EPA’s teaching that activated carbon, as “the most extensively studied sorbent for mercury adsorption,” was “the most likely candidate to reach commercialization for mercury removal in the near future.” *Id.* at 29 (citing Ex. 1009, 32); *see also* Ex. 1009, 32 (“Increased 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.”).

Petitioners also allege that Mass-EPA provides an express motivation to combine the teachings of these references, that is, to “improv[e] mercury adsorption efficiency of activated carbons . . . with the goal of improving carbon to mercury injection rates and reducing control costs.” Pet. 30 (citing Ex. 1009, 39); *see also id.* at 29 (“Availability of low-cost and efficient sorbents and effective particulate collection are key in implementation of this type of mercury control.”) (quoting Ex. 1009, 32); *id.* (“[E]stimated costs for powdered activated carbon injection-based technology, which most

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likely will reach commercialization for mercury control before other technologies, is within the current control costs for NOx' (another type of pollutant).") (quoting Ex. 1009, 58). Petitioners contend that using Mass-EPA's activated carbon injection in Vosteen589's method would result in "improved mercury-adsorption efficiency, achieving the Mass-EPA's stated goal of 'reducing control costs.'" *Id.* at 30 (citing Ex. 1002 ¶ 315).

The current record supports that Petitioners' combination of Vosteen589 with Starns and with Mass-EPA would have been "the mere application of a known technique to a piece of prior art ready for the improvement." *KSR*, 550 U.S. at 401. Indeed, "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 level of a POSITA at the time of the alleged invention. *See generally* Prelim. Resp. Thus, Petitioners have provided sufficient reasoning with rational underpinnings to explain why a POSITA would have modified the teachings of the applied references. *See KSR*, 550 U.S. at 418.

We acknowledge Patent Owner's arguments to the contrary, but are persuaded by Petitioner's arguments on this record. 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." *Id.* at 418. And further, "[t]he

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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. 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.

To the extent that any portions of Dr. Niksa’s testimony may be contradictory, Patent Owner will have the opportunity to test the veracity of Dr. Niksa’s opinions over the course of trial. *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 596 (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 related ’114 patent after initially rejecting the claims on a similar basis. Prelim. Resp. 13–14. That issue is best raised and resolved through the process involving a bifurcated procedure for considering discretionary issues, such as 35 U.S.C. § 325. *See* USPTO Memorandum, Interim Process for PTAB Workload Management (March 26, 2025), *available at* <https://uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt-20250326.pdf>.

In sum, based on the current record and for purposes of institution, we find Petitioners have shown sufficiently that the combination of Vosteen589 with either of Starns or Mass-EPA teaches the limitations of claim 1. We

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also find Petitioners have shown adequately a motivation to combine the teachings of Vosteen589 with those of Starns or Mass-EPA with a reasonable expectation of success in doing so. In other words, Petitioners have established a reasonable likelihood of prevailing on their assertion that the combination of Vosteen589 with either of Starns or Mass-EPA renders claim 1 obvious. We, thus, institute trial to review the challenged claims of the '430 patent.

Petitioners also assert that the combination of Vosteen589 with either of Starns or Mass-EPA renders claims 2–4 and 6–29 obvious. Pet. 35–60. Patent Owner does not argue these claims separately. *See* Prelim. Resp. 8–19. In any event, we institute an *inter partes* review as to all challenges raised in the Petition. *See SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018); *see also* 37 C.F.R. § 42.108(a) (“When instituting *inter partes* 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.”).

D. Alleged Anticipation by Downs-Boiler

Petitioners assert that Downs-Boiler anticipates claims 1–4, 6–9, 14–16, 18, 19, and 22–28. Pet. 61–77. Based on this record, and for at least the following reasons, we determine Petitioners have established a reasonable likelihood that they would prevail in this assertion.

1. Downs-Boiler

Downs-Boiler discloses that “[b]romine-containing compounds, added to the coal, or to the boiler combustion furnace, are used to enhance the

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oxidation of mercury, thereby enhancing the overall removal of mercury in downstream pollution control devices.” Ex. 1006, code (57).

Downs-Boiler’s Figure 2 is reproduced below:

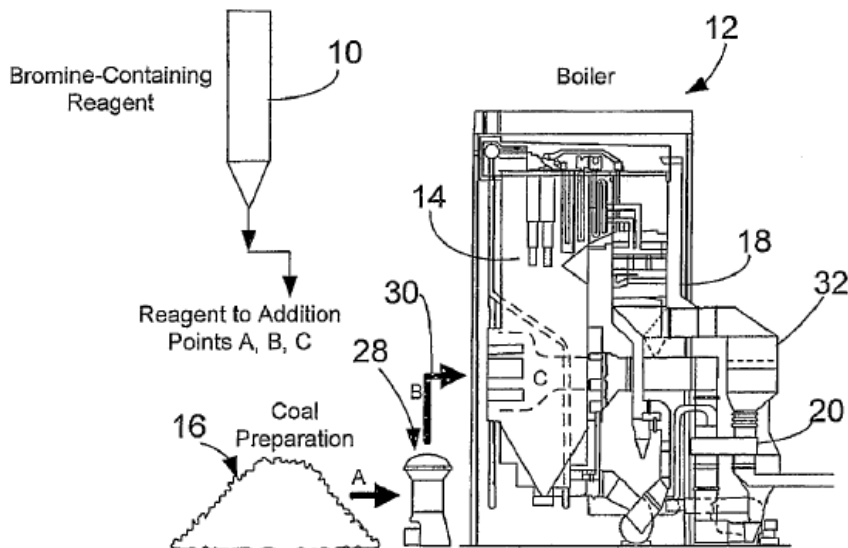


FIG. 2

Figure 2 shows adding bromine to improve mercury removal from flue gases. *Id.* ¶ 10.

Downs-Boiler discloses that, in Figure 2, 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. It 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.*

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¶¶ 15, 25. It states that “experimental results indicate that bromine addition also results in an increased fraction of particulate-bound mercury.” *Id.* ¶ 15.

2. Analysis

Petitioners provide detailed mapping of each limitation of the challenged claims to Downs-Boiler’s disclosure. Pet. 62–77. At this preliminary stage, Patent Owner does not dispute that Downs-Boiler discloses all of the limitations of the challenged claims. *See* Prelim. Resp. 19–47. On this record, and for purposes of institution, we find Petitioners’ analysis persuasive.

The parties, however, dispute Downs-Boiler’s prior-art status. *See* Pet. 61–62; Prelim. Resp. 19–47. We address the parties’ arguments below.

Petitioners assert that Downs-Boiler “qualifies as prior art, with a priority date of March 22, 2004, when [Provisional Patent Application No.] 60/555,353” (“the Downs-Boiler Provisional”) was filed. Pet. 61 (bolding removed); *see also id.* at 17 (listing Downs-Boiler as prior art under pre-AIA 35 U.S.C. § 102(e)). Petitioners provide a redline comparison between Downs-Boiler and the Downs-Boiler Provisional as evidence that the “disclosure of Downs-Boiler is supported by Downs-Boiler-Provisional.” *Id.* (citing Ex. 1032). Petitioners also identify where in the Downs-Boiler Provisional the limitations of claim 1 of Downs-Boiler can be found. *Id.* at 61–62 (citing Ex. 1007 ¶¶ 2–6, 18, 19, 21, 27, Fig. 2). Petitioners point out that the Board “previously found that Downs-Boiler qualifies as prior art as of March 22, 2004.” *Id.* at 61 (citing Ex. 1026, 84–85, 96).

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Patent Owner argues that Petitioners have failed to meet their burden to show Downs-Boiler qualifies as prior art. Prelim. Resp. 19. To remove Downs-Boiler, a U.S. patent application publication, as a prior art reference, Patent Owner must establish “reduction to practice prior to the effective date of the reference, or conception of the invention prior to the effective date of the reference coupled with due diligence from prior to said date to a subsequent reduction to practice or to the filing of the application.”¹⁴ *In re Steed*, 802 F.3d 1311, 1316 (Fed. Cir. 2015); 37 C.F.R. § 1.131(b).

Patent Owner argues that the inventors “have testified that they conceived of the invention at least by August 2002, and . . . reduced the challenged claims to practice at least as early as September 2003.” Prelim. Resp. 20 (citing Ex. 2018). According to Patent Owner, “[t]hese dates are corroborated by contemporaneous meeting presentations, testing logbooks, and post-testing reports.” *Id.* at 21 (citing Exs. 2013–2015, 2017, 2024–2033).

¹⁴ The parties dispute whether Patent Owner has provided sufficient evidence relating to conception and diligence. *See* Prelim. Resp. 21–23; Reply 12–13; Sur-reply 12. We do not analyze the sufficiency of Patent Owner’s purported evidence on conception and diligence because 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. Instead, the latest date on which Patent Owner asserts a reduction to practice predates the date Petitioners identify as Downs-Boiler’s priority date. *See* Prelim. Resp. 24 (“During tests conducted in September 2003, December 2003, and February 2004, the inventors reduced the claims of the ’430 Patent to practice.”); Pet. 61 (identifying March 22, 2004 as Downs-Boiler’s priority date).

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Specifically, Patent Owner asserts that “[d]uring tests conducted in September 2003, December 2003, and February 2004, the inventors reduced the claims of the ’430 Patent to practice by performing tests using sodium bromide as the pre-combustion chamber additive and activated carbon as a post-combustion sorbent.” *Id.* at 24 (citing Ex. 2018, Claim chart exhibit). According to Patent Owner, “[t]hese tests were described in reports provided to the DOE.” *Id.* at 24–25 (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 25–27 (citing Ex. 2017; Ex. 2018 ¶¶ 31–39; Ex. 2012; Ex. 2004, 292:9–293:22). Patent Owner also argues that “[i]nventor John Pavlish has described similar documentation for the December 2003 and February 2004 tests” (*id.* at 28 (citing Ex. 2018 ¶¶ 31–49)) and “explained the results at trial” (*id.* at 28–29 (citing Ex. 2004, 260:5–20)).

Patent Owner contends that “reduction to practice is confirmed by testimony from all three inventors (Exs. 2003, 2018) and corroborated by non-inventor testimony (Ex. 2017), logbook entries (Ex. 2017), and DOE reports (Exs. 2012–2014).” *Id.* at 29. Patent Owner provides “a summary of evidence on an element-by-element basis” for claims 1, 8, 9, 13, and 15–17. *Id.* at 30–46 (citing Ex. 2012–2014). Patent Owner asserts that the remaining claims “are reflected in the inventors’ testing for the same reasons described above.” *Id.* at 47.

Petitioners counter that Patent Owner “has not produced evidence that the ’430 Patent is entitled to a pre-AIA filing date, such that that a ‘swear behind’ is available.” Reply 12 (citing Ex. 1004; Pet. 13). Petitioners

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contend that even if Patent Owner could attempt to swear behind Downs-Boiler, it has failed to do so. *Id.* at 12–13.

Petitioners argue there is no evidence of early actual reduction to practice. *Id.* at 13. According to Petitioners, although Patent Owner asserts that “reduction to practice is confirmed by testimony from all three inventors” (Prelim. Resp. 29), Patent Owner “submits an inventor declaration only from Mr. Pavlish (Ex. 2018), who does not even discuss the ’430 Patent.” *Id.* In addition, Patent Owner’s assertions are “based on unwitnessed laboratory notebooks,” which is insufficient to support a claim of reduction to practice. *Id.* (citing *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1170 (Fed. Cir. 2006)).

Petitioners further argue that there is “no evidence of an actual reduction to practice ‘that met all the limitations of the claim.’” *Id.* (quoting *Steed*, 802 F.3d at 1318). Specifically, Petitioners argue that

[t]here is no corroborating evidence for limitations from the independent claims, such as: (i) “the coal comprises an additive comprising Br₂, HBr, bromine compound, or a combination thereof, wherein the additive is added to the coal before the coal enters the combustion chamber”; (ii) the “combustion chamber comprises” these species; and (iii) “the mercury-containing gas comprises a halogen or halide promotor comprising HBr, Br⁻, or a combination thereof.”

Id. at 13–14. Petitioners argue that “[d]isclosure of one species (NaBr) does not demonstrate possession of the undisclosed ‘HBr’ or ‘Br₂’ species or the ‘bromide compound’ genus.” *Id.* at 14. Petitioners further assert that Patent Owner fails to carry its burden because it “ignores the vast majority of the ’430 Patent claims.” *Id.* at 14.

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Finally, Petitioners assert that the inquiry on dates of conception and actual reduction to practice “is best left for trial after full development of the record,” considering that they “have had no opportunity to depose the declarants to probe their declarations.” *Id.* at 14–15.

To establish an actual reduction to practice, 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). We analyze evidence supporting the reduction to practice under a “rule of reason.” *Id.* at 1076.

Petitioners bear 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 a patent challenger “bore the burden of persuasion . . . on all issues relating to the status of [the asserted reference] as prior art”).

Here, because Petitioners initially show Downs-Boiler qualifies as prior art on its face, Patent Owner bears the subsequent procedural burden to produce evidence antedating the reference. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378–80 (Fed. Cir. 2015); *Magnum Oil*, 829 F.3d at 1375. Although the burden of production can be a shifting burden, the burden of persuasion is on Petitioners to ultimately prove

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“unpatentability by a preponderance of the evidence,” and that this burden never shifts to Patent Owner. *Dynamic Drinkware*, 800 F.3d at 1378.

Patent Owner has come forward with evidence and arguments that Downs-Boiler does not qualify as prior art, due to the asserted prior reduction to practice. *See* Prelim. Resp. 24–47; Sur-reply 12–15. At this stage in the proceeding, Patent Owner does not persuade us that its evidence and arguments merit denial of institution.

As an initial matter, we agree with Petitioners that the issue of whether Patent Owner reduced the claimed method to practice is best reserved for trial because Petitioners have had no opportunity to depose Patent Owner’s declarants. Reply 14–15. 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.” Sur-reply 14. This argument presupposes that we agree with Patent Owner on its real party in interest/privity argument, which as explained above (*supra* Section II), on this record, we do not find persuasive. Further, according to Petitioners, “no one litigated validity of the ’430 Patent, as it was not asserted at trial in Delaware or in an IPR. And for the patents actually asserted at trial, the Delaware defendants did not present any evidence of invalidity.” Reply 6.

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

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bromines/bromides ‘would behave similarly’ to NaBr,” pointing to testimony and discussion in the ’430 patent on how the claimed method works. Sur-reply 14 (citing Ex. 2018, 9–11, 15–16;¹⁵ Ex. 2004, 246:13–259:12; Ex. 1001, 29:8–16). But the evidence Patent Owner identifies does not directly address the issue of why the species “NaBr” supports the claimed “HBr” and “Br₂” species or the “bromide compound” genus.

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 Petitioners have presented sufficient evidence that Downs-Boiler is prior art for purposes of 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 Petitioners’ argument that pre-AIA 35 U.S.C. § 102 does not apply. Reply 11–12.

As Patent Owner points out, and Petitioners do not dispute, “[t]he ’430 Patent claims priority back to the provisional application through a chain of continuations and a divisional application. There are no continuation-in-part applications in the chain connecting the ’430 Patent to the provisional application.” Sur-reply 11 (citing Ex. 1004). Accordingly, absent evidence, not present in the record on this case, that the continuation

¹⁵ Patent Owner’s citation to Exhibit 2018 uses the pagination added by Patent Owner. The panel prefers the parties cite to declaration evidence by paragraph number.

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or divisional applications in the '430 priority chain do not support the challenged claims, the '430 patent appears to be a pre-AIA patent.

In IPR2025-00423, Petitioners provide extensive arguments that the challenged claims are not entitled to priority because the continuation applications do not support the challenged claims. In our Institution Decision there, we analyze the 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.

Emphasizing that the Petition “assumes *arguendo* that the Challenged Claims of the '430 Patent have priority to August 30, 2004, . . . and that the pre-AIA statute applies,” Patent Owner argues that Petitioners have forfeited the issue of whether pre-AIA § 102 applies. Sur-reply 11 (quoting Pet. 3) (emphasis omitted). 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. This is particularly true given that the Petition expressly states that if Patent Owner attempts to swear behind any asserted references, Petitioners “may rebut such arguments at that time,” including by asserting

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“that the ’430 Patent cannot claim priority to any pre-AIA parent application, so cannot swear behind references.” Pet. 18.

In sum, based on the current record and for purposes of institution, we find Petitioners have shown sufficiently that Downs-Boiler qualifies as prior art. We also find Petitioners have shown adequately that Downs-Boiler discloses all the limitations of the claims challenged under this ground. In other words, Petitioners have established a reasonable likelihood of prevailing on their assertion that Downs-Boiler anticipates claims 1–4, 6–9, 14–16, 18, 19, and 22–28.

E. Alleged Obviousness over Downs-Boiler and Starns or Mass-EPA

Petitioners assert that claims 1–4 and 6–29 would have been obvious over Downs-Boiler and Starns (Ground 4), and over Downs-Boiler and Mass-EPA (Ground 5). Pet. 77–97. At this preliminary stage, Patent Owner does not dispute that each combination of the asserted prior art teaches all of the limitations of these claims. *See* Prelim. Resp. 19–47. Instead, Patent Owner focuses its argument on challenging Downs-Boiler’s prior-art status. As explained above, on this record, we determine Petitioners have shown a reasonable likelihood that Downs-Boiler is prior art. *See supra* Section III.D.2.

Thus, based on this record, we determine Petitioners have established a reasonable likelihood that they would prevail in showing obviousness of claims 1–4 and 6–29 over Downs-Boiler and Starns or Downs-Boiler and Mass-EPA.

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IV. CONCLUSION

Based on the current record, and for the reasons explained above, we find Petitioners have demonstrated a reasonable likelihood that they would prevail with respect to at least one claim challenged in the Petition. We, therefore, institute an *inter partes* review of all challenged claims on all asserted grounds.

This Decision is not a final determination on the patentability of any challenged claim. Our view with regard to any conclusion reached in the foregoing could change upon further development of the record during trial. We remind the parties that any argument not raised in a Patent Owner Response to the Petition, or permitted in another manner during trial, shall be deemed forfeited and/or waived even if asserted in the Preliminary Response. *In re Google Tech. Holdings LLC*, 980 F.3d 858, 862–64 (Fed. Cir. 2020) (holding an argument forfeited when not timely raised before the Board); *In re NuVasive, Inc.*, 842 F.3d 1376, 1380–81 (Fed. Cir. 2016) (holding Patent Owner waived an argument addressed in the Preliminary Response by not raising the same argument in the Patent Owner Response).

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V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is hereby instituted on all challenged claims of the '430 patent based on all the asserted grounds set forth in the Petition; and

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

FOR PETITIONER:

Brian Oaks
David Tobin
Syed Fareed
Christian Tatum
MCDERMOTT WILL & EMERY LLP
boaks@mwe.com
dtobin@mwe.com
sfareed@mwe.com
ctatum@mwe.com

R. Scott Johnson
Thomas Patton
FREDRIKSON & BYRON, P.A.
rsjohnson@fredlaw.com
tpatton@fredlaw.com

Michelle Kemp
PERKINS COIE LLP
kemp-ptab@perkinscoie.com

Michael Piery
Lauren Bolcar

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QUARLES & BRADY LLP
michael.piery@quarles.com
lauren.bolcar@quarles.com

FOR PATENT OWNER:

Hamad Hamad
Justin Nemunaitis
Richard Cochrane
CALDWELL, CASSADY & CURRY P.C.
hhamad@caldwellcc.com
jnemunaitis@caldwellcc.com
rcochrane@caldwellcc.com