

Technical Committee Meeting Minutes
Technical Committee, TC 6.4 Combined Heat & Power Systems
Tuesday, June 24, 2025: 3:30 PM - 5:00 PM MST

Location: Sheraton Phoenix Downtown, Room: Coronado Boardroom (Level 3)
Meeting Format: Hybrid

Chairs and Voting Members:

Position	Term	Name	Voting Status	Present
Chair	06/30/2026	Michael Calabrese	VM	Yes
Vice Chair	06/30/2026	Praveen Cheekatamarla	VM	Yes
Secretary	06/30/2026	Kathryn Hinkelman	Non-VM	Yes
Program Subcommittee Chair	06/30/2027	Mahabir Bhandari	Non-VM	Yes
Handbook Subcommittee Chair	06/30/2027	Alok Kumar	VM	Yes
Standards Subcommittee Chair	06/30/2025	Dragos Paraschiv	VM	Yes
Research Subcommittee Chair	06/30/2025	Farzin M Rad	VM	Yes
Membership Subcommittee Chair	6/30/2025	Geoffrey Bares	Non-VM	No
Webmaster	6/30/2027	Joel Deddens	VM	Yes
Member	06/30/2027	Zhiming Gao	VM	Yes
Member	06/30/2026	William A Ryan	VM	Yes

Guest Attendees: Complete attendance list in Appendix A.

Position	Name	Present
Member	Vikas Patnaik	Yes
IDEA Liaison	John Andrepont	Yes
TC 8.3 Liaison	William A Ryan	Yes

MINUTES

1. Welcome & Introductions – TC Chair (Michael Calabrese) hosted the hybrid meeting
 - a. The Chair (Michael Calabrese) Called to Order at 3:30 pm.
 - b. Name, organization, and positions on committee. Roll call.
 - c. Quorum has been established with 8 voting members present.

2. The Chair (Michael Calabrese) discussed the Purpose Statement

TC 6.4 is concerned with combined heat and power (CHP) systems, their cycles and components including heat recovery, combustion turbine inlet cooling (CTIC), energy conversion and system integration. The systems provide both electrical/mechanical power and cooling/heating thermal energy and are also known as cogeneration systems; trigeneration systems; and combined cooling heating and power systems.

3. Meeting Minutes from the 2025 (Orlando) Winter Meeting
 - a. Copies of the draft minutes of the Orlando meeting were distributed to the members.
 - b. Changes from Farzin Rad were sent to Secretary Kathryn Hinkelman before the meeting. These changes will be adopted.
 - c. **MOTION** – To approve the meeting minutes of the 2025 Winter Meeting. Motion by Alok Kumar, second by Joel Deddens, all Yea, no Nay. **Motion passed unanimously, 8-0-0-CNV.**

4. Subcommittee Reports
 - a. Program: Mahabir Bhandari (Subcommittee Chair)
 - i. Seminar and technical paper topics were discussed.
 - ii. The first seminar topic: CHP in Data Centers
 1. Several committee members are interested in participating:
 - a. ORNL is conducting research on integrating CHP with data centers, focusing on design architectures with colocation.
 - b. Kathryn Hinkelman proposed a topic on multidomain modeling extending her PhD and Post Doc.
 - c. Alok Kumar is interested to present a topic (subject TBD).
 - d. A project involving small modular reactors and data centers was discussed (e.g., Air Force base in Alaska using high-temperature nuclear heat).
 2. Seminar Planning:
 - a. Mahabir Bhandari suggested two separate seminars based on topics discussed (data centers, micro-CHP/other).
 - b. Praveen Cheekatamarla highlighted the unique load characteristics of data centers and their growing global footprint (18% projected).
 - c. A seminar session with three presenters is being planned. Submission deadline: August 1. Presenters must attend in person.
 - Mahabir Bhandari (architectures)

- Kathryn Hinkelman (modeling)
 - Praveen Cheekatamarla (load profile perspective)
 - d. Session length: 90 minutes should be requested.
 - e. Bill recommended aligning with Track 9: Grid Resilience.
 - f. Titles for the seminar were discussed, including:
 - “CHP for data centers to provide grid resilience”
 - “Powering the future...”
 - “Cogeneration for data centers for grid resiliency”
 - The goal is a catchy title that is short in length and starts with keywords to emphasize focus (when truncated by ASHRAE)
- 3. Additional Suggestions and Contributions:
 - a. Farzin Rad proposed research on integrating microchips with adsorption chillers for data center cooling.
 - b. John Andrepont suggested a forum format to explore how various technologies can support the data center boom.
 - c. Discussion on terminology: “cogeneration”, “trigeneration”, or “CCP” may be more appropriate for broader appeal.
 - 100-200MW data centers are a new scale.
 - New equipment at this scale can be included.
 - The novelty is in the application of CHP.
 - d. Mahabir Bhandari emphasized the need to engage industry.
 - e. Steam-driven chillers vs. absorption chillers were discussed as potential co-sponsored topics.
 - f. Michael Calabrese offered to bring in an industry speaker on steam-driven chillers.
 - g. Combined-cycle CHP was identified as another topic.
- iii. A second seminar topic: Micro-CHP and Small Data Centers:
 1. Zhiming Gao discussed how their micro-CHP lab work could be presented at the Winter Conference.
 - a. He is collaborating with Georgia Tech on micro-CHP.
 2. Farzin Rad discussed opportunities for CHP in small server rooms (<20 tons), with potential for scaling.
 3. Praveen Cheekatamarla discussed solid oxide fuel cells for micro-CHP and offered to bring an industry speaker.
 4. Praveen volunteered to chair this session.
- iv. Future Topics and Collaborations:
 1. Zhiming Gao proposed high-temperature heat pumps (lifting waste heat to 90°C for space heating). This could be a standalone seminar or paper.
 2. CHP in building applications (Zhiming)
 3. For Summer 2026 in Austin: John Andrepont suggested to recruit UT Austin (Roberto Del Real, Head of Facilities) to present on their system (the largest CHP facility in the U.S).
 4. Michael Calabrese inquired about engaging IDEA. John noted interest in using data center waste heat in district networks (e.g., Equinix).

5. Zhiming Gao and Joel Deddens volunteered to chair a session on CHP in buildings (Austin meeting).
- b. Co-Sponsored Sessions:
- i. Bill Ryan encouraged attendance at Seminar 60 (Thermal Energy, TC 8.3) – Wednesday AM.
 - ii. For Las Vegas: TC 8.3 is organizing a session on Sustainable Thermally Driven Heat Pumps for Grid Resilience (Track 9).
 1. TC 8.3 has 2 of 3 presentations set.
 2. **MOTION** – William Ryan (TC 8.3 Chair) requested co-sponsorship from TC 6.4 and asked for a vote to cosponsor. Motion by Farzin, second by Vikas Patnik, all Yea, no Nay. **Motion passes unanimously. 8-0-0 CNV.**
 - iii. Bill Ryan to coordinate with TC 8.3 on reciprocal co-sponsorships. He can get approval if we have a title.
 - iv. College of Fellows is interested in co-sponsoring seminars and requires one presentation per session.
- c. Research: Farzin Rad (Subcommittee Chair)
- i. RAC Meeting Update:
 1. Budget: \$3.9M for research.
 2. RTAR Submissions: None since March 2025; one submitted in May 2025.
 3. ASHRAE now provides free access to project reports for members.
 4. Research promotion campaign has raised \$2.3M (6.4% below target).
 5. Next RTAR/Work Statement submission deadline is August 15.
 - ii. Research Topics:
 1. Abstract submitted on integrating microchips with thermally driven chillers for small data centers.
 2. Focus: Design, application, and techno-economic feasibility of micro-CHP systems.
 3. TC 8.3 agreed to co-sponsor the RTAR.
 4. **MOTION** – Committee approval was requested to vote on submitting the RTAR. Motion by Farzin Rad, second by Joel Deddens, all Yea, no Nay. **Motion passes unanimously. 8-0-0 CNV.**
 5. Dragos Paraschiv is revising the Fuel Cell in Buildings Design Guide and targeting an RTAR submission in September.
- d. Handbook: Alok Kumar (Subcommittee Chair)
- i. No update (Alok no longer present at the time).
- e. Standards: Dragos Paraschiv (Subcommittee Chair)
- i. Standards Committee Meeting Update:
 1. Attended training on procedures and public review processes.
 2. 100 documents published for public review; 19 standards finalized.
 3. ASHRAE is developing procedures for AI integration and harmonizing standards.
 4. Harmonization plan approved on June 21; implementation will be incremental.

- ii. SBC204 – Micro-CHP Standard:
 - 1. Joel Deddens and Dragos Paraschiv attended.
 - 2. The workplan was reviewed in the first meeting.
 - 3. Monthly web calls and biannual meetings planned.
 - 4. OneHub platform to be used for document sharing.
 - 5. Two-year service term for committee members.
 - 6. Encouragement to apply and join the committee.
 - 7. SBC204 (2020) has a list of items for revision.
 - iii. Other Standards: Bill Ryan inquired about SPC205 (Campus Plants) and its relevance to CHP. It may focus more on distribution than central plants.
- f. Membership: Reported by Michael Calabrese (TC Chair)
- i. Michael will review the current committee roster. (Note: Subcommittee chair Geoffrey Bares is currently on PTO.)
 - ii. Membership and participation: Interested individuals are encouraged to visit the ASHRAE website to join the TC.
 - iii. Local chapter engagement:
 - 1. There is a recognized gap between ASHRAE’s TCs and local chapters.
 - 2. Bridging this divide by promoting CHP at the chapter level was discussed.
 - 3. Michael Calabrese has spoken with Gearoid Foley regarding delivering CHP-related presentations at local chapters, potentially leveraging content from IDEA presentations.
 - 4. There is strong presence from controls and manufacturers’ representatives in local chapters.
 - iv. Chapter Technology Transfer Committee (CTTC):
 - 1. Most ASHRAE chapters host monthly technical presentations.
 - 2. The Louisville chapter was mentioned as a potential venue. Coordinating a speaker visit might be possible.
- g. TC Website: Joel Deddens (Webmaster)
- i. The website is up to date expect for the link itself (1.10 link is still present).
 - ii. TC 6.4 is live here: <https://tpc.ashrae.org/?cmtKey=54cc808d-d44e-40ae-aa06-0b83279413a3>.
 - iii. This final link fix is on the ASHRAE Staff’s list, but low priority. Joel will continue following up until complete.
 - iv. All other information is up to date.
- h. Honors & Awards: Geoffrey Bares (Subcommittee Chair)
- i. No updates (Geoffrey not present).

5. Old Business (Chair)

- a. Kathryn Hinkelman shared the Orlando minutes with participants. No outstanding items were identified.
- b. Basecamp will be updated after the website link is fixed.

6. New Business (All)

- a. IDEA Liaison Update:
 - i. John Andrepont gave an update on IDEA and their current activities.
 - ii. IDEA held a successful Annual Conference in Minneapolis, MN this past June.
 - iii. The Campus Energy conference is in Washington, DC in February 2026.
- b. Committee Membership Terms:
 - i. The term for some committee members (including Farzin Rad and Dragos Paraschiv) is expiring 6/30/2025.
 - ii. The Chair will put in a roster update with the section head to reinstate these positions and will circulate the update with all committee members.
- c. Educational Initiatives
 - i. Bill Ryan and Ryan Milcareh are developing a Co-generation Course proposal for ASHRAE Learning Institute (ALI), currently under review.
 - ii. Bill and Ryan shared the status of the Cogeneration course, which the committee will review.
 1. History: A cogeneration course on the basics of CHP was previously taught Lukas Himan in 2018. Ryan was approached by ASHRAE to update and offer this course.
 2. Course updates: Bill and Ryan are improving images, links, etc.
 3. Format and timeline:
 - a. The course is a 6-hour offering.
 - b. Pending approval, the updated course is expected to be completed within the next few months.
 - c. The initial offering is planned for the upcoming Winter Meeting and will be delivered in person.
 - d. Virtual options are being considered for future sessions.
 4. Course approval is still pending (contact: Alex Coffman).

7. Adjourn

- a. Announcement by TC Chair (Michael Calabrese) to close this session at 5:00 pm.
- b. **MOTION** by Joel Deddens, second by Dragos Paraschiv, all Yea, no Nay.
Motion passed unanimously. 8-0-0 CNV.

Submitted by
Kathryn Hinkelman, Ph.D.
Secretary, TC 6.4.

TC 6.4 COMBINED HEAT AND POWER SYSTEMS

2025 ASHRAE Annual Meeting (June 21-25, 2025); Phoenix, AZ

TC Website: <https://tpc.ashrae.org/?cmtKey=54cc808d-d44e-40ae-aa06-0b83279413a3>

Subcommittee Meeting

Handbook, Program, Research, Membership Subcommittee

Tuesday, June 10, 2025: 1:00 PM-2:30 PM Eastern; Virtual

[Join the meeting now](#)

Meeting ID: 218 399 235 802 5

Passcode: Zp3uh7ZV

Or call in (audio only)

+1 321-414-2369,,230533283#

Phone conference ID: 230 533 283#

TC 6.4 Committee Meeting

Tuesday, June 24, 2025: 2:30 PM-4:00 PM

Sheraton Phoenix Downtown, Coronado Boardroom (Level 3)

[Join the meeting now](#)

Meeting ID: 216 986 741 958 3

Passcode: 4h95vJ99

Or call in (audio only)

+1 321-414-2369,,821919254#

Phone conference ID: 821 919 254#

AGENDA

- | | |
|---|------------------------------|
| 1. Welcome | Chair, Michael Calabrese |
| 2. Roll Call / Introductions | Chair / All |
| 3. Introduction of ASHRAE Liaisons on Arrival | Chair |
| 4. Establishment of Quorum | Secretary, Kathryn Hinkelman |
| 5. TC6.4 Purpose Statement | Secretary |
| 6. Minutes of the 2025 Winter Meeting (Orlando) | Secretary |
| 7. Subcommittee Reports | |
| a. Program | Mahabir Bhandari, Mike Huylo |
| b. Research | Farzin Rad |
| c. Handbook | Alok Kumar |
| d. Standards | Dragos Paraschiv |
| e. Membership | Geoff Bares, Joel Deddens |
| f. TC Website | Joel Deddens |
| g. Honors & Awards | Geoff Bares |
| 8. Old Business | Chair |
| 9. New Business | All |
| 10. Next Subcommittee and Committee Meetings | Chair |
| 11. Adjourn | All |

Purpose Statement:

“TC 6.4 is concerned with combined heat and power (CHP) systems, their cycles and components including heat recovery, combustion turbine inlet cooling (CTIC), energy conversion and system integration. The systems provide both electrical/mechanical power and cooling/heating thermal energy and are also known as cogeneration systems; trigeneration systems; and combined cooling heating and power systems.”

Appendix A: Attendees

In-Person Attendees:

Name	Email	Affiliation	Status	YEA?
John Randtke	john.randtke@se.com	Schneider Electric	CM	Y
Praveen Cheekatamada	Cheekatamap @ornl.gov	ORNL	CM	N
Farzin Rad	frad@gtienergy		VM	N
Michael Calabrese	michael.calabrese@tmg.com	TMG	VM	N
Joel Deddens	JDeddens@KCCMEG.com	KCC	VM	Y
Ryan Milcard	Ryan.Milcard@asu.edu	ASU	CM	Y
MICHAEL PATNAIK	MPATNAIK@ASU.EDU	ASU	CM	N
		CONTROLLED AIR	CM	N
DRAGOS PARASCHIV				
	dragos.paraschiv@munter.com	Munter	VM	Y
Annette Dwyer	annette.dwyer@munter.com	Munter	CM	N
Zach Lando	Zachary.Lando@uponor.com	Uponor	Guest	Y
Rohit Dhumane	rohit.dhumane@ daranetechnologies.com	Darane	Guest	N
Doug Laird	drlaird@uwisc.edu	UW Madison	Guest	N
Michael Stearn	michael.stearn@tmc-ag.com	TMC	Guest	N

Remote Attendees:

- Alok Kumar (phone below)
- Kathryn Hinkelman (took screenshot, thus name not listed)
- Vikas Patnaik (signed in under Ayesha Patnaik)

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AD	Annette Dwyer (External)
AP	Ayesha Patnaik (External)
MB	Bhandari, Mahabir (Unverifi...)
MC	Calabrese, Michael (External) Organizer
DP	Dharam Punwani (External)
DP	Dragos Paraschiv (External)
ZG	Gao, Zhiming (Unverified)
JD	Joel Deddens (Unverified)
JA	John Andrepont (Unverified)
MH	Mike Huylo (Unverified)
BR	Ryan, Bill (Unverified)