

Meeting Minutes

December 13, 2023

GWAC Members

David Forfia, Acting Chair, Principal Consultant,
Utilicast

Ron Ambrosio, Independent Energy
Transformation Professional

Andrew Bordine, GWAC

Ron Cunningham, IT Enterprise Architect,
American Electric Power

Lorenzo Kristov, Principal, Electric System
Policy, Structure, Market Design

Mark Ortiz, Lead Architect, Schneider Electric

Farrokh Rahimi, Executive Vice President, Open
Access Technology International, Inc.

Aaron Snyder, Dir. of Grid Technology
Consulting, EnerNex

Leonard Tillman, Partner, Balch & Bingham, LLP

Shawn Chandler

Josh Dean

Larisa Dobriansky

Chris Irwin

Ali Ipakchi

Jeremy Roberts

David Katz

Yilu Liu

Stephen MacDonald

Seemita Pal, PNNL

Tylor Slay, PNNL

GWAC Associates & Emeritus

Rahul Bahadur, Associate

Marc Costa, Associate

James Mater, Emeritus

Ken Wacks, Emeritus

PNNL Support

Jaime Kolln, PNNL GWAC Administrator

Ron Melton, PNNL GWAC Administrator

Susie McGuire, GWAC Coordinator

GWAC Guest Speaker

Brian Patterson, EMerge Alliance

Hawk Asgeirsson

GWAC Friends

Meeting Minutes

December 13, 2023



Agenda December 2023

Call to Order and Roll Call

- Welcome

GWAC Administrative Business

- Minutes
- Upcoming events
- Call for Candidates
- GWAC Accomplishments
- Action Items
 - The Next Big Thing

Guest Speaker – Brian Patterson

Future Activities

- Planning 2024 "TE" Conference
- GWAC April Face-to-Face
- GWAC Strategic Outreach Plan

Work Product Status Reports

- GWAC Projects Overview Chart review
- Working Party Status Updates
 - Grid Architecture White Paper
 - Grid Future State White Paper
 - Grid Arch for Regulators White Paper
 - Applying Grid Architecture Concepts to Bridge Back from the Future Grid
 - Grid Architecture Concept Model for Interconnection, Electrification, and Decarbonization
- Liaison Reports

New Business

December GWAC Guest Speaker – Brian Paterson, Emerge Alliance

Jaime announced that Mark Paterson will lead the new white paper, "GWAC Future Work Products."

Jaime Kolln, GWAC Administrator, opened the meeting. Chair Ron Bernstein is away on vacation; David Forfia is filling in today on his behalf.

Jaime asked if everyone had been sent the November GWAC meeting minutes for review and the group agreed. Ken Wacks commented that he had no edits. David Forfia gave a motion to approve the GWAC November minutes. Ron Ambrosio seconded the motion.

November Meeting Minutes Approved

The group reviewed the upcoming list of GWAC related conferences. David Forfia noted that he will attend DistribuTech 2024.

Meeting Minutes

December 13, 2023

Farrokh, Ron M, and Jaime Kolln will attend the Seattle IEEE PES Conference. Stephan McDonald noted that he will attend also.

Add to list: April 30 to May 2 San Diego V2G forum (James Mater)

<div>  Conferences and Events </div>					
Date	Event	Location	Attend	Speaker	Topic
Nov 6-9, 2023	ISGT Latin America	San Juan, PR	Farrokh Rahimi, Lorenzo Kristov and maybe Kay Aikin		Disaster recovery and network transformation in times of climate Change
Jan. 17-19, 2023	Energy Storage North America	San Diego, CA	Russ Weed		Combined with Intersolar North America
Jan. 22-24, 2023	AHR Expo	Chicago, IL			Co-sponsored by ASHRAE and AHRI and is held concurrently with ASHRAE's Winter Conference
February 19-22, 2024	ISGT North America	Washington DC	Mark Paterson, Farrokh Rahimi, Paul DeMartini, Kay Aikin		ISGT North America
February 26-29, 2024	DistribuTech 2024	Orlando, FL	Farrokh Rahimi		
May 6 – 9, 2024	IEEE PES T&D Conference & Expo	Anaheim Convention Center			Accelerate the Grid of Tomorrow
July 21 – 25	IEEE PES General Meeting	Seattle, WA			
Sept 9-12, 2024	RE+ Anaheim, CA & GWAC Conference	Anaheim, CA			

Meeting Minutes

December 13, 2023



Call for Candidates Open!

Potential candidates should have demonstrated visionary capacity, team effectiveness, and an acknowledged level of recognition and credibility in their professional fields, along with specific skills and experience.



<https://gridwiseac.org/index.php/call-for-candidates/>

- Nominations are open now
- Call will close on December 15th
- At least one candidate will be chosen
- Council members serve a two-year term



https://gridwiseac.org/pdfs/gridwise_architecture_council_bylaw.pdf

10

- Ron Melton noted that this is a self-nomination process, no nomination is needed.
 - Candidates submit their application documents as directed from the call for candidates on the GWAC website.
- The website encourages candidates to send a note of their intent to submit an application early on so that the GWAC Administrators are aware.

Meeting Minutes

December 13, 2023



GWAC Accomplishments

2015-2022 – [Annual Transactive Energy Systems Conference](#) (since 2019, IEEE PES partnership event)

2022 – [Blog Post #5 – Decarbonization efforts of three Northern California CCA's](#) - Bahadur

2022 – [Blog Post #4 - Decarbonization of the Electric Grid](#) – Bernstein

2022 – [Blog Post #3 - Energy Equity in Decarbonization](#) - Negash

2022 – [Blog Post #2 - Grid Infrastructure Challenges In A Decarbonized World](#) – Aikin

2021 – [Blog Post #1 - Decarbonization – The Pattern that Has Emerged](#) - McCafferty, McCormick, Forfia

2020 – [Transactive Energy FAQ](#)

2020 – [Smart Buildings as a Transactive Energy Hub](#)

2020 – [Decision Maker's Interoperability Checklist v.1.6](#)

2020 – [Reliability and Resilience Considerations for TE Systems](#)

2019 – [GridWise® Transactive Energy Framework V1.1](#)

2018 – [TE Systems Research, Development and Deployment Roadmap](#)

2016 – [TE Decision Makers Checklist](#)

2015 – [Valuation of Transactive Energy Systems Proceedings](#)



Jaime mentioned the GWAC website which includes videos from recent GWAC meetings.



Action Items

- Send speaker ideas to Jaime Kolln and Ron Bernstein know and copy Susie McGuire.
- Ron Bernstein to confirm to OATI for GWAC Spring F2F April 16-18, 2024
- Susie sent a poll to GWAC regarding attendance at the Spring F2F
- Jaime to invite the Council to a January Strategic Outreach Meeting
- Website updates
 - Create a GWAC database of presentations for future talks and a speakers bureau post on the website.
 - Create a catalog of speaker materials with links.
 - AHR composite video posted
 - Feedback on format and errors requested
- Discussion of the GWAC Mission statement
 - Recurring “strawman” Task Force – entire Council to be invited

Meeting Minutes

December 13, 2023

Jaime encouraged GWAC members to suggest future guest speakers

Jaime thanked Farrokh and OATI for the Spring 2024 F2F invitation; Ron B. will be formally confirming to OATI. Farrokh said the meeting will be held in the new Microgrid Technology Center.

Emerge: Jaime mentioned that we like to share the recording of presentations, extracting from the recording and posting to the website. We can double back with Emerge about that.

Jaime asked GWAC to let Susie and Jaime know if they find any broken links on the website.

Jaime noted that one goal of the refresh of the GWAC Mission, Vision, and Structure including the by-laws of the GWAC will be separated out a bit more to make it easier to navigate on the website.



Guest Speaker

Brian Patterson

Emerge Alliance



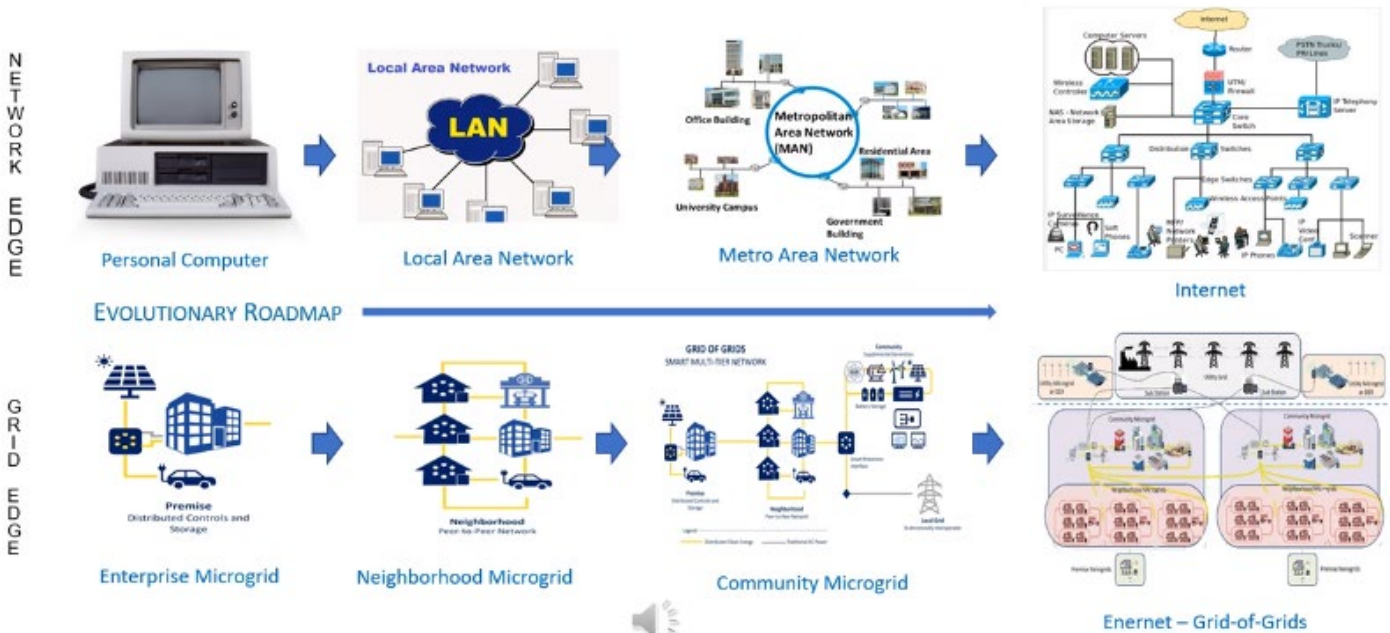
<https://www.emergealliance.org/>

Meeting Minutes

December 13, 2023

Information & Electricity Systems Architecture

APPLYING THE LESSONS OF THE INTERNET TO ENERGY SYSTEMS OVER TIME



An open industry association

Leader in promoting the greater use of DC and hybrid AC/DC microgrids & power systems

In lieu of a slide presentation on the EMerge Alliance, you can learn more about us and our work at <https://www.emergealliance.org/>

EMerge Alliance – Hybrid AC/DC & DC Microgrid Standards & Information

Brian will explain what they mean by the Grid of Grids architecture and microgrids which are actually nanogrids. They focused on DC coupling rather than AC so that the network does not have to be synchronized. Voltage must be regulated but it doesn't have to be synchronized.

He said we never want to lose what we have in the AC assets.

Meeting Minutes

December 13, 2023

They use all of the tools of the toolbox to create the Grid-of-Grids. There is room for AC power to support analogue which is still used in some things.

The DC and hybrid AC DC standard outlines what they believe are the ideal and required tenants of a hybrid DC coupled system. Many are familiar with DC for micro-electronics but in higher applications many are unfamiliar.

How to incorporate DC in the architecture is something they want to help with. Emerge will soon release a design tool that incorporates tenants of the standard and the compatibility of components/interoperability. It's a tool to manage interoperability decisions. They have framework models for each piece of equipment that might be in a microgrid.

Memberships are paid, fee based, and relatively modest fees.

Academics and national labs qualify for complimentary memberships and meeting attendance.

Some events that Emerge Alliance hosts are open attendance such as interoperability data modeling format for devices that are universal – they characterize equipment input and output – that is an open-source effort.

They are about to release an open-source effort for fault level power.

Jaime Kolln thanked Brian for presenting to the GWAC today.

Stephan MacDonald thanked him for his work on power flow analysis. He asked on to pencil it out and how to get the people who own the assets on the supply side to get the loads to respond in all of these nested envelopes. He also asked where will you involve management of customer assets?

Brian replied that a lot depends on the members which include utilities to single home individuals. One DC coupled unit, with AC appliance homes, that TECO (Tampa) installed was the only system in the neighborhood that stayed powered during the recent large hurricane. He explained their microgrid system structure to Ken. Brian noted the system would support charging with DC out of the "pock box." The neighborhood is all DC. There is a distribution and generation support at the neighborhood level to support the houses.

Stephan asked how you compensate the people for participation?

Brian said it's done by the utility. The homeowner does not have to invest. The utility works with the home builders to incorporate the equipment such as rooftop solar and a lock box which are installed at the time of building. It's supported by the grid operator, not a third party. He said they typically generate an excess of power and had it been set up should have been able to send out power to the rest of the community outside of the microgrid.

Ron Cunningham mentioned the green field. He asked if the company has thought of brown fields? He asked how they work out the physics to string other power to the power portion of poles?

Meeting Minutes

December 13, 2023

Brian said the easy challenge is the green fields. Green fields represent a smaller percentage of the market and doesn't inspire appliance manufacturers but there are many brushless motors now and they just put a rectifier upfront. To make a brownfield on-ramp we are working on a dual input standard. We hope manufacturers will make devices that could be AC or DC. To migrate home by home, you could stay grid connected with AC until the utilities decide to put in additional power feed. Utilities are anxious to deliver more power. For typical big power requirements, there could be a two- or three-year delay until they are ready. Regulations may dictate what is done.

Brian replied to Ron C. that a lot of companies are installing dual lines for AC and DC and then they can use either. He said LG is ready to manufacture DC appliances. Ways of pulling the dual lines through conduit is being developed. On both sides of the meter entities are piloting this approach.

Brian said he looks forward to having a deeper relationship with GWAC. He would be happy present again later on to show some things that have been done in Florida, Vermont, and Maryland.



“Next Big Thing” / “Back from the Future”

- Presented at AHR Expo
- Recordings to be Developed and Published to YouTube
- Next Steps
 - Council Member volunteers needed to develop a webinar on "The Next Big Thing"
 - Rahul Bahadur and Ron Ambrosio volunteered
 - Development of a concise slide deck
 - Web Page with details including GWAC activities



Ron A. updated on what this group is doing. He and Rahul have set the objectives for the meetings.

Jaime asked them to invite him to their meetings as optional. Rahul is reviewing relevant material. They will invite Jaime as an optional attendee.

Meeting Minutes

December 13, 2023

Rahul said they are looking for some feedback. Ron A. said since it will be a webinar it is planned to be 60 to 90 minutes including the Q&A. The starting point will be the material from the AHR Expo. That was a two-hour panel session. Some of the material will be included in summary. Attendees can be referred to the recorded material. This will be discussed at the next meeting.

Stephan said he would volunteer to join the group. Jaime will post the link to the video from the GWAC website in the chat. The video is located on the GWAC website.

Jaime noted that Tylor Slay, PNNL has a file for Susie with GWAC website broken links.



Planning the “TE” Conference

- Co-Located at RE+ in Anaheim, CA September 9-12, 2024
 - Specific Format TBD, but planning on plenaries and two tracks
 - RE+ Technical session is Monday and Tuesday.
 - GWAC "TESC" will be Wednesday and Thursday
- Schedule Organizing Committee (OC) Meeting
 - Coordinating with Lesley Fondren and Lori Smith
 - May collaborate with IEEE for technical publications. Awaiting direction from RE+
- Council Members Participating in the Organizing Committee
 - At Least 4 Council Members
 - No papers this year
 - Sponsorship TBD
 - David Forfia has volunteered to be the Treasurer. This may not be needed for RE+
 - Need to understand associated fees. Will be tiered based on SEPA/SEIA membership.
 - Call for participation is the kickoff; it will include a timeline of due dates for presenters.

Transactive Energy is on the slide for now but will not be included in the topic this year.

Leslie and Laurie with RE+ have been tied up recently with other meetings

There will be no papers submitted this year.

David Forfia is still our noted Treasurer but should not have any duties with the RE+ arrangement. He may need to help with fee tiers. RE+ can help us understand what is needed for a fee schedule.

Some discussion about who we announce the meeting and call for papers to. We won't have papers, but we may have panels this year.

Meeting Minutes

December 13, 2023

The meeting invitation will be sent out to the GWAC distribution lists, which includes past participants. The call for participation will also be listed on the GWAC website; it should link to the RE+ site for registration.

Ron M. explained that in the past the GWAC would specifically invite people to join in the technical panels. The intent of their talk was based on a set of questions to be discussed in the workshop. The questions are meant to put all the people on a level playing field. Panel talks were 10 minutes or less so the whole panel was 30 to 40 minutes, after which the audience would then break into small groups for discussions. In some years we had assigned GWAC facilitators to actively engage participants in the panel session and to keep the discussion around the preset questions and topic areas.

The call for participation outlined the framework for this. Both the Interop meetings and the TESC conferences featured a GWAC foundational session each year. This was a set of presentations by GWAC council members on a chosen theme. Also, each day of the meetings would usually feature a keynote speaker which aligned with the conference theme.

Some material was recommended to be read before the session.

Ron A. said the structured nature of the call for participation was very key. The topic was not open-ended.

Jaime said if the GWAC Foundational Session is about Architecture Concepts that should be appropriate for this year?

Ron M said that the Foundational session was the opening plenary session. It may start the conference or proceed after an opening keynote by a notable guest speaker.

Ron A. said the foundational session levels the attendees and gets them focused on the main theme of the conference.

Ron said that GWAC has always had something they were working on and wanted to discuss with the community. They did this with the Interoperability Framework, the Roadmap and with the Interoperability Decision Makers Checklist. Ron A. said it was done even with the early Interoperability conferences.

Ron Melton said that Mark Paterson had organized an international session for the TESC conference one year and that was the start of his involvement with the GWAC. Ron M. suggested asking Mark to host an international session at this upcoming conference.

Jaime will schedule an organizing meeting with RE+ meeting in January. This would be a nuts and bolts type of meeting with just himself, Ron Bernstein, and Ron Melton.

Action: Jaime to schedule an organizing meeting with RE+ in January.

Meeting Minutes

December 13, 2023

Ron M. also suggested starting recurring meetings for a GWAC Conference organizing committee in January with a broader group of GWAC. He said to expect to need to hold these bi-monthly starting very soon to keep the conference on track.

Action: Jaime/Susie to schedule recurring GWAC Conference organizing meetings.

Jaime let everyone know to expect invites to be sent out soon.



GWAC Face-to-Face Meetings

- Discuss F2F meetings for 2024



- Spring meeting planned for April 16 -18 2024
 - DC, PNNL, NEMA, San Diego, NRECA, OATI, Schneider
 - 20th Anniversary
- September 13 (after the conference)
 - Casa Bernstein, RE+?, Energy Coalition

Jaime announced that the Spring 2024 F2F will be the GWAC 20th anniversary – maybe Chris will attend?

Ron B. has sent out the official acceptance letter to OATI. Ron B. said he had held off until we did the poll. More than half of the Council is planning to attend. Ron M. said 3 or 4 GWAC members should create a committee to organize the meeting and to identify and invite notable potential speakers located in the area of the meeting (Ron M named 3 entities including Exelon).

Action: Jaime/Susie to organize a Spring F2F Committee meeting.

Ron M. said that we probably won't be able to use the RE+ location for a Fall F2F because time wise it will be up against a weekend. Ron M. said to consider holding it the day before the conference.

Jaime said he had been thinking about a day ahead meeting.

Action: Jaime to discuss with RE+ people about the option of a day ahead meeting. Would there be a complementary room available? It would be a short F2F meeting, primarily administrative.

Meeting Minutes

December 13, 2023



Grid Architecture White Paper

- Working Group: Seemita Pal, Ron Cunningham, David Wollman, Ron Bernstein, Ahlmahz Negash, Larisa Dobriansky, David Forfia, Kay Aikin, Aaron Snyder, Ron Ambrosio, Lorenzo Kristov, Farrokh Rahimi, Rahul Bahadur, Gerald Gray, Mark Paterson, Timothy Schoechle, Jeff Morris, Leonard Tillman, Andrew Bordine, Chris Villarreal, Ron Melton
- White paper contents reviewed, revised and finalized. **Contents ready!**
- Next steps
 - The white paper formatting and look are being further enhanced – pretty straightforward and would be complete soon.
 - “About the Council” section is being made consistent with the Future States paper.
 - Blog post will be created to advertise the publication

Seemita noted that the technical content is ready.

Action: Susie to send out new GWAC White Paper cover format from PNNL Creative Services for GWAC feedback.

Jaime and Ron C. have been discussing updates to the “About the Council” in the white paper as part of the new GWAC standard template.

Meeting Minutes

December 13, 2023



GWAC Future Work Products Discussion

Applying Grid Architecture Concepts to Bridge Back from the Future Grid

in concert with current work and building on the previous GridWise Architecture Council work products, this document attempts to provide a roadmap for operators, planners, developers, integrators, and policy makers as guidance to develop interoperable systems that will architect the grid of the future as described in the future states. This paper will include discussions of motivating participation of customer owned assets and opportunities for avoided costs by working toward a long-term vision rather than only short-term needs. This document will be completed in FY24.

- Committee : **Mark Paterson**, Costa, Ambrosio, Forfia, Aikin, Kristov, Rahimi, Rahimi, Snyder, Kristov,
- 2PM PT/ 5PM ET Thursday 2 times 1st and 3rd Thursday of the month

Meeting Minutes

December 13, 2023

Liaison Reports

- NIST – David Wollman
 - Green Button – Jeremy Roberts (*New*)
 - EPRI – Sean Crimmins, Ben Ealey
 - IEEE PES – Farrokh Rahimi
 - ASHRAE, CTA, ASHB (formerly CABA) – Ron Bernstein
 - ISO/IEC, IREC – Ken Wacks
 - SEPA – Aaron Smallwood
 - NARUC – Jeff Morris
- *Are there other organizations we should be hearing from?*

Wollman, David A. NIST – We're continuing to work towards stakeholder outreach development and implementation strategy for the national standard strategy as part of our leadership role in developing a implementation strategy for the US National Standards Strategy for Critical and Enabling Technologies – there is a public listening session 19 Dec, see <https://www.nist.gov/news-events/events/virtual-listening-session-us-government-national-standards-strategy-critical-and> for the link (which will be posted day-of-event).

Anyone interested is welcome to attend.

A formal RFI just went out. David has been stressing the importance of things such as energy usage, data standards such as Green Button and energy systems standards.

Also, please see our December 2023 newsletter:

<https://content.govdelivery.com/accounts/USNIST/bulletins/37f24b7>

December 2023 feature on easy EXPRESS software

<https://content.govdelivery.com/accounts/USNIST/bulletins/37e9157>

Meeting Minutes

December 13, 2023

November 2023 newsletter <https://content.govdelivery.com/accounts/USNIST/bulletins/37966dc>

Jaime said he would attend the one on a national standards strategy.

Green Button - Jeremy Roberts – edited video link from the annual general meeting that he mentioned in November. He put a link to the edited video of the meeting which is 30 minutes shorter than the live meeting to cut out time spent switching from speaker to speaker. The YouTube link is below.

<https://the-gba.org/2023agm>

Jaime said that he saw Chris Irwin with his Green Button lanyard on at a recent meeting in DC.

Ron M. said the PES General meeting will be held this July in Seattle. Seemita Pal is the chair this year. He said there will be a career fair at the conference and companies can have a table at the fair. Tables are \$500. It's a good opportunity for companies to talk to students who are attending. There will be great speakers from DOE, industry, and national labs.

Seemita said there are time slots available for "tech talks." Unlike panel sessions, these can focus on the organization that is putting them on and can promote their companies' activities.

Ron M. said there will also be panel sessions at the conference which are multi-disciplinary and multi-organizational.

Ken Wacks, chair of the ISO/IEC committee developing the "Home Electronic System" (HES) family of international standards, and chair of the Customer Grid Edge committee at the Interstate Renewable Energy Council (IREC).

Ken said there are currently six documents out for ballot. Four are related to Gateway and Cyber Security. Member nations have to pass by 2/3 yes and less than one quarter no. To start a project at least 5 countries must participate in deliberations. There are about 40 countries that review proposed HES standards. Formal comments are resolved to reach consensus and approval by the member nations.

IREC Customer Grid Edge committee meetings are continuing. This week it will be John Young, the CEO of Technology & Smart Systems, a new start up will be speaking. He will talk about connectivity from the outside world to houses and to consumers, and on IOT. He will introduce his technology called the ROUTER BOX acting as a central hub for smart homes. The meeting is open to all, there is no charge.

The Interstate Renewable Energy Council (IREC) hosts Customer Grid Edge (CGE)—a committee of experts that seeks to improve interoperability between energy service providers and customer-sited equipment including renewable energy, energy storage, and microgrids.

This month's meeting will be the second round table discussion lead by the CEO/CTO of a company called Technology.

Meeting Minutes

December 13, 2023

Meetings are open to anyone in the industry at no cost. To receive an invitation, interested individuals can email info@irecusa.org.

Jaime asked Ken about testing and certification for ANSI/CTA-2045, which became an American National Standard and an ISO/IEC international standard. Ken replied that there is an organization called the Northwest Energy Efficiency Alliance in Portland, Oregon that is investigating testing and certification for this standard.

Aaron Smallwood, SEPA was not able to be on the call today.

Ron Melton replied for SEPA – he announced that in Spring Seemita Pal will take over the SEPA Grid Architecture working group since he will be retiring at the end of April. Seemita will take this position on as co-chair with Ron Cunningham. There is good work going on including work with the Common Info Model especially with distribution systems, and with grid ontology related to transactive energy systems, which is a joint effort with the Transactive Energy Working Group.

Ron noted that SEPA now has a new tier of membership to expand their membership which should allow people to include their SEPA participation in pilot projects. Contact Aaron Smallwood about it.

Ron Cunningham said more information is available on the SEPA website. Technical reports are also available there for publicly available documents.

Jaime emphasized that there is a lot of good information on their site.

Marc Costa mentioned a data framework for grid data sharing activity that he and Lorenzo participated in with NARUC. It pertains to Grid Data and DER data. He said in California there is a scope of work about to be released by the PUC to facilitate it. It will be contentious. He said it will pertain to utilities not having data and consumers owning it. There is a grid data sharing playbook that is pretty balanced and may be of interest to some of the GWAC participants. It was issued a couple weeks ago by NARUC.

Ron M. said that DOE had a task related to this. Marc said Chris was at one of the meetings. This is not really a standard; it is a playbook. It is publicly available: <https://mailchi.mp/naruc.org/naruc-releases-grid-data-sharing-framework-and-playbook?e=c5fd21603c>

Brian Patterson suggested that in lieu of a slide presentation on the EMerge Alliance, you can learn more about Emerge at <https://www.emergealliance.org/>

<https://mailchi.mp/naruc.org/naruc-releases-grid-data-sharing-framework-and-playbook?e=c5fd21603c>

Aaron Snyder said that GWAC participants can still order shirts and other logo items, there is a company that will work with us. He will put a link in the chat. Anything in the catalogue can be ordered with the GWAC logo.

Action: add GWAC meetings to the calendar, Feb. was moved up one month. March has not yet been scheduled.

Meeting Minutes

December 13, 2023



Adjourn

Next meeting – January 17, 2024



<https://gridwiseac.org/>