

Meeting Minutes

July 27, 2022

GWAC Members

David Forfia, GWAC Chair

Kay Aikin, Founder, CFO, Dynamic
Grid/Introspective Systems

Ron Ambrosio, Independent Energy
Transformation Professional

Ron Bernstein, President, RBCG, LLC

Andrew Bordine, VP Energy Mkts & Innovation,
Anterix

Ron Cunningham, IT Enterprise Architect,
American Electric Power

Gerald Gray, Sr. Program Manager, Electric
Power Research Institute (EPRI)

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

Ahlmahz Negash, Sr. Power Analyst, Tacoma
Power

Farrokh Rahimi, Senior Vice President, Open
Access Technology International, Inc

Aaron Snyder, Dir. of Grid Tech. Consulting,
EnerNex

Leonard Tillman, Partner, Balch & Bingham, LLP

GWAC Associates & Emeritus

Rahul Bahadur, VMWare, Inc.

Stuart McCafferty, Siemens

Ken Wacks, Home, Building & Utility Systems

GWAC Members and Assoc. not present

Paul DeMartini, Managing Partner, Newport
Consulting

Mark Paterson, CSO, Strategen

Chris Villarreal, President, Plugged In Strategies

GWAC Guests

Marc Costa, the Energy Coalition

Sean Crimmins, EPRI

Jaime Kolln, PNNL

James Orenstein

Seemita Pal, PNNL

Hayden Reeve, PNNL

PNNL Support

Susan McGuire, GWAC Coordinator

Ron Melton, Acting PNNL Administrator

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Chair Ron Bernstein called the meeting to order with a quorum at 10:03 am Pacific

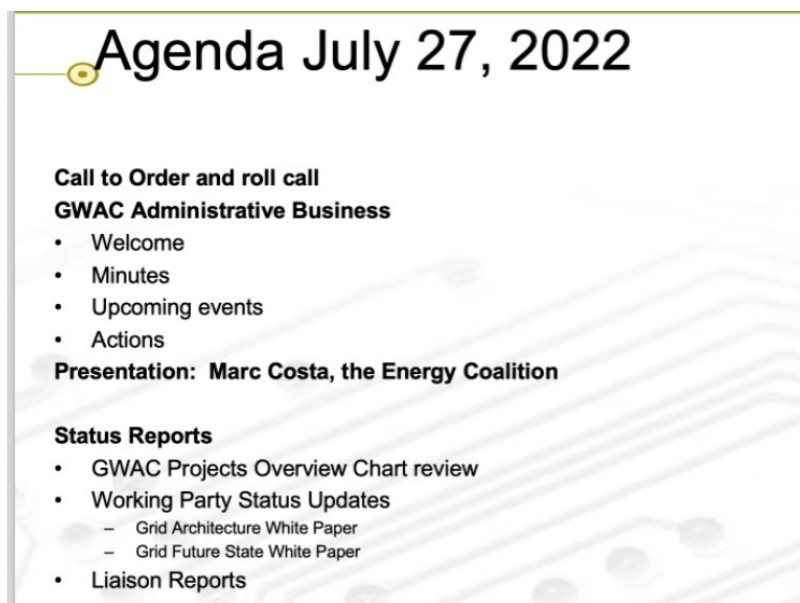
He thanked David Forfia for his long tenure as the GWAC Chair.

Ron Melton read the proprietary notice

Ken Wacks asked to present his liaison report early this month.

Ron Bernstein asked if there had been any changes requested for the June GWAC meeting minutes.

Susie noted a grammatical change made to the minutes, sent in by Ken Wacks. Ron Bernstein asked for a motion to approve the June minutes. David Forfia gave the motion to approve, and Ron Ambrosio seconded the motion. The minutes were approved with no objections.



Ken Wacks – ISO/IEC has scheduled the Energy Standards meeting on developing home energy management standards for homes and buildings as well as related infrastructure to begin middle of September. The group is producing new standards and many documents are circulating among the nations for comment.

Ken Wacks – IREC: The Customer Grid Edge Meetings continue to meet every other Friday. At the meeting scheduled for August 5 Mark Paterson with Strategen will present on the major transformation underway of the energy grid in Australia. They are leading the world on the transformation toward Distributed Energy Management, DER.

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The meeting August 5 will be held at 4:00pm Eastern time to accommodate Mark's time zone. The meeting will be open to anyone, just contact Ken at kenwacks.com and he will help you get connected.

Ron Melton mentioned that Chris Irwin had attended a recent IREC meeting.

🕒 Conferences and Events

Date	Event	Location	Attend	Speak	Topic
Sept 19-22, 2022	SEPA RE+	Anaheim, CA	Ron Melton, Ron Cunningham, Farrokh Rahimi ?	Yes	
Oct 4 – 6, 2022	GWAC F2F	San Diego	ALL	GWAC	
Jan 16-19, 2023	IEEE ISGT	Washington, DC		Yes	
Feb 4-8, 2023	ASHRAE (Co-sponsor with IEEE) / AHR Expo	Atlanta, GA	Ron Bernstein, Farrokh Rahimi (tent)	Yes	Standardized Building Datasets for Benchmarking Control Algorithms, Energy Efficiency, Modeling, and Decarbonization, Possible GWAC F2F

Ron Bernstein asked that those who are planning to attend the **SEPA RE+ meeting** to let Susie McGuire know so that we can plan for GWAC attendance.

Farrokh Rahimi said that he is waiting to be approved as a SEPA member. If so, he is planning to attend, and he will let Susie know.

- Trevor Hardy, PNNL will attend; he is chair of the SEPA TE Working Group.
- Jaime Kolln, PNNL will attend

David Forfia will attend the Digital 360 Conference in Austin, TX, Sept. 6 – 9.

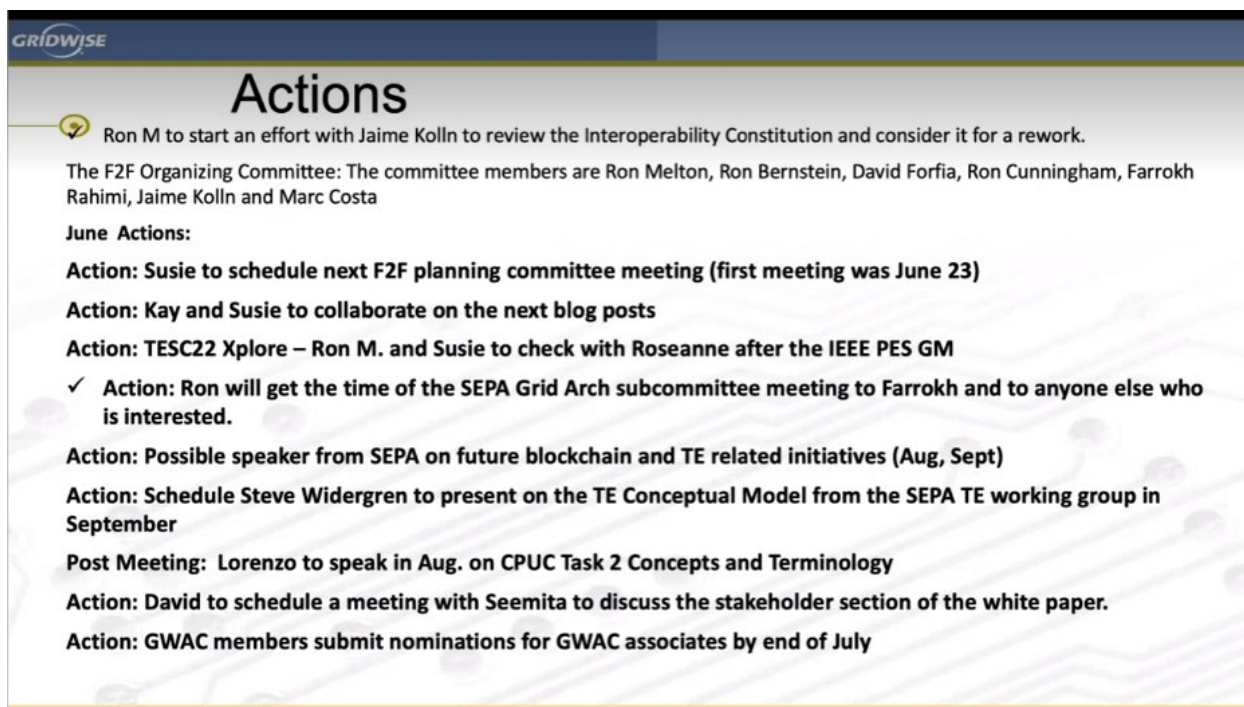
Ron Ambrosio asked if the dates are set for the GWAC F2F in San Diego. The dates are set provided the local COVID rates are low.

Aaron Snyder said he will send a poster/paper to the International Council on Large Electric Systems (<https://www.cigre.org/GB/events/cigre-session-2022> CIGRE) Aug 28 to Sept 2, 2022, in Paris France although a colleague will present on his behalf due to a conflict.

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Ron Bernstein noted the opportunity for GWAC to hold a F2F meeting at the AHR Expo in February 2023. He said that GWAC will have access to a meeting room at no charge.



Actions

- ✓ Ron M to start an effort with Jaime Kolln to review the Interoperability Constitution and consider it for a rework.

The F2F Organizing Committee: The committee members are Ron Melton, Ron Bernstein, David Forfia, Ron Cunningham, Farrokh Rahimi, Jaime Kolln and Marc Costa

June Actions:

- Action: Susie to schedule next F2F planning committee meeting (first meeting was June 23)**
- Action: Kay and Susie to collaborate on the next blog posts**
- Action: TESC22 Xplore – Ron M. and Susie to check with Roseanne after the IEEE PES GM**
- ✓ **Action: Ron will get the time of the SEPA Grid Arch subcommittee meeting to Farrokh and to anyone else who is interested.**
- Action: Possible speaker from SEPA on future blockchain and TE related initiatives (Aug, Sept)**
- Action: Schedule Steve Widergren to present on the TE Conceptual Model from the SEPA TE working group in September**
- Post Meeting: Lorenzo to speak in Aug. on CPUC Task 2 Concepts and Terminology**
- Action: David to schedule a meeting with Seemita to discuss the stakeholder section of the white paper.**
- Action: GWAC members submit nominations for GWAC associates by end of July**

Kay Aikin asked GWAC participants to please repost the latest blog by Ahlmahz Negash on social media to help increase visibility for her blog post, “Energy Equity in Decarbonization.”

The next blog to be posted is authored by Ron Bernstein. Susie will work with Ron to get it posted to the GWAC website in the next couple weeks.

Farrokh noted that IEEE has contacted the TESC 22 paper authors to get their copyright forms submitted so that the papers can be published in Xplore.

Steve Widergren will present the TE Conceptual model at the September GWAC meeting.

Lorenzo Kristov will present on CPUC Task 2: Concepts and Terminology at the August GWAC meeting.

Seemita Pal and David Forfia are in contact regarding the Grid Architecture white paper.

Ron Cunningham – noted that at the recent IEEE PES conference there was a great presentation on block chain and contracts. It had good information about this topic.

Farrokh Rahimi organized the Block Chain on TE panel, but this was a different session.

Ron Melton introduced Marc Costa with the Energy Coalition, today’s Guest Speaker.

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Marc Costa will give an overview of a meeting that he recently attended and will share some of the highlights. It was held in Ireland and had good international participation.

He was invited to the meeting by Lynn Kiesling, University of Denver.



Update on Global Observatory on Peer to Peer Networks (GO-P2P)

GWAC July 2022 Meeting

Introduction to GO-P2P

- Synopsis
 - The Global Observatory is a forum for international collaboration to understand the policy, regulatory, social and technological conditions necessary to support the wider deployment of peer-to-peer, community self-consumption and transactive energy models.
- 200 Experts; ~9 Countries; organized by tasks/sub-tasks
- Website: <https://userstcp.org/task/peer-to-peer-energy-trading/>

They are looking at the future of markets.

What is GO-P2P

- The first international, pre-competitive, and early stage research collaboration on the whole systems implications of local energy models.
- Leading institutions researching P2P, TE, CSC
- International exchange of valuable evidence on factors determining uptake of these models and their viability.
- Platform for collaboration(policy makers, businesses, NGOs, researchers).

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Organizational Structure

- Organizational Structure
 - Technology Collaboration Programme of the IEA
 - Staffed by University College of London
- Launch in 2019
- Funded by various national/subnational governments

Recap of F2F Meeting

- Hosted breakout sessions on each of the topics (right) in the context of subtasks (below)

Subtasks

1. **Power systems integration**- led by Lucerne University of Applied Sciences and Arts, Switzerland (contact: Benjamin Bowler, benjamin.bowler@hs-nl.ch)
 2. **Hardware, software & data**- led by the International Energy Research Centre, Ireland (contact: Brian O'Regan, brian.oregan@iea.ie)
 3. **Transactions and markets**- led by University of Colorado Denver, United States (contact: Lynne Kiesling, <http://knowledgecommons.net>)
 4. **Economic and social value**- led by University of New South Wales, Australia (contact: Declan Kieth, d.kieth@unsw.edu.au)
 5. **Policy and regulation**- led by European University Institute/Pierson School of Regulation, Italy (contacts: Nicola Roseffo, Nicola.Roseffo@euai.eu) and Lucile de Armentis, Lucile.DeArmentis@euai.eu)
 University College London (United Kingdom), represented by the Task Leader Alexandra Schneiders (a.schneiders@ucl.ac.uk), is in charge of overall management of the Observatory as well as the analysis of findings.

Topics (across sub-tasks)

Flexibility
Interoperability
Equity
Sociality
Governance
Privacy
Security
Value stacking
Standards
Resilience
Communication
Others?

In the EU they are thinking of challenges, regulatory barriers and p2p trading. EU has simple licenses to be a retailer with limited touch regulation and they are trying to open the retailer space to allow P2P trading. Peers could be independent retailers and that's one way to sidestep regulation. It hasn't been done yet, but they are looking at this.

Ron Ambrosio thought it would be good to try to reach out to this group and introduce them to the GWAC particularly if they might be hosting a future meeting in North America.

Lorenzo asked Marc if the group is involved with the movement to Energy Communities in Europe. He said there is some EU legislation that allows the construction of that and is that part of the IEA effort? – is it part of the IEA effort?

Lorenzo's second question was to ask what is the US perspective as you participate – these kind of local energy markets are not legal in the U.S. with front of meter resources. All front meter systems must go through the bulk power market. How do you see the US situation fitting into this work?

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Marc said he will give his answer, but he may not have the most insight. He said that the same challenges exist as far as regulatory barriers and P2P trading. You can be a trader with a limited touch. They are trying to open the retailer space to allow P2P trading with peers as independent retailers. They are looking into this and have some legal support in that area.

And he said the U.S. is seen as all about prices and devices without caring about people.

Ron M. noted that in the US the utilities now call customers and not “rate payers.”

Lorenzo said that front of the meter resources can’t just be used to serve local customers in an IOU territory or ISO. There is a barrier in this area which won’t allow this to take off.

Ron M. asked about what is happening in CA under the Community Microgrids banner. Lorenzo said that PG&E has an experimental tariff proposal called CMEP for Community Microgrid Enablement Program. There is a Redwood Coast Airport Microgrid. It’s only allowed to operate as a microgrid when the grid power goes down and the utility decides to empower it as such. They see no value in it operating otherwise as a microgrid. Lorenzo had another example as well. The legislative change needed is to allow local resources to service local load without going through the wholesale market. But FERC would need to allow these changes. He noted that just the front of meter ones have to go through the wholesale market. And he said that there are access and participation charges involved.

Lorenzo’s question generated a lot of discussion and examples around microgrids and regulation.

Marc gave a link to a fall meeting to be held in Crete, SNIPPET school in October 2022:

<https://www.esat.kuleuven.be/cosic/events/snippet-school-2022/>

Marc gave a google drive (view only) link to his presentation

https://docs.google.com/presentation/d/1voz6UMmC8DITDY6ptTBpB8ojwvGdK9KVjRSDW3BSCQE/edit#slide=id.g13e74e00f07_0_0

Marc noted that this group is looking for more participants from the west and anyone interested can contact him, he would be happy to get you connected with the group.

Ron B. suggested putting the slides on the GWAC Website. Ron M. put the slides on the Teams site.

Hayden said that Chris Irwin with DOE OE is an advocate. He’s not sure how much the BTO office would be interested.

Marc said if the next Face to Face meeting is held in California, he would certainly welcome Hayden’s participation.

It would be an international meeting.

The suggested dates would be the first week of January 2023 or first week of July 2023. Ron Melton, Hayden Reeve, and Marc Costa could talk more later.

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Ron Bernstein suggested co-locating the meeting with the AHR Expo since GWAC will have a meeting room available at that conference.

Marc noted the in-person attendance was about 40 people.

Marc is most interested in having them meet in California since some California proceedings are of interest to the group. One day of the three days would focus on some California issues.

Ron Bernstein said that SDG&E may be able to offer them use of a conference room. He offered to help me with that connection. Marc thought that was a good idea. He has some Los Angeles connections as well.

Kay Aikin is involved with the COP 27 and the 2022 Clean Energy Ministerial meeting to be held in Pittsburgh, PA from Sept 21 – 23, 2022. It is sponsored by Carnegie Mellon University and the DOE. Secretary Granholm had announced the meeting at the UN Conference of Parties (COP26). Scott Foster, Director of the U. N. Energy Sustainability Group is working on high performance buildings effort and Kay is looking at it as to how the buildings interact with the Grid. Kay is bringing those thoughts together with GWAC and Buildings Technology.

Ron is expecting to attend a Mission Innovation meeting at the same overall meeting.

👁 2022 Fall GWAC Workshop Meeting-in-Retreat

- Format F2F (possible limited hybrid component)
- Date – Oct. 4, 5, 6 is proposed. The Organizing committee will be reviewing this.
- Location – San Diego location – at the home of Ron Bernstein, Encinitas, CA
 - Topics (under consideration):
 - Future grid
 - PNNL Grid Architecture distribution transformation work
 - Microgrids USACE Model – Guest speaker
 - Utility drivers at SoCal - Mark Martinez/Anthony James – SCE/SDGE/PGE
 - CAISO and/or CPUC or CEC – Guest speaker
 - IEEE/ASHRAE/GWAC Collaborative effort - Decarbonization
- Organizing committee so far: Ron Bernstein, David Forfia, Ron Cunningham, Farrokh Rahimi, Jaime Kolln, Ron Melton and Marc Costa
- First meeting held June 23
- Next meeting: August 4 10am PT

GWAC F2F Planning Update

A proposed theme is the GWAC Future Direction.

Possible topics will be discussed Aug. 4 at the next organizers meeting

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GWAC would like to have some outside speakers.

Ron B. noted that there is a new effort by ASHRAE and IEEE to collaborate in committee work on decarbonization of building to grid. Ron B. has been asked to join this effort and he would then like to involve GWAC in it as well.

Ron M. noted that this came up at the IEEE PES meeting last week in a committee meeting of smart buildings and load. Someone from ASHRAE introduced it.

The proposed effort would be part of the Loads Subcommittee, for sharing high-resolution data on loads. There was a lot of data generated on this in the late 70's and early 80's of the BPA sponsored LCAP project – PNNL ran it for BPA. There was submetering in houses which generated some datasets. There seems to also be a lack of high-fidelity data available on load modeling. Data for modeling is a need.

Farrokh Rahimi is also interested in it.

Ron B. also noted that a proposal in development for ASHRAE and there is a need for a panel discussion by ASHRAE, IEEE and GWAC on datasets for modeling and real applications.

Ron B - It would be part of the ASHRAE conference, registration would probably be needed. Probably would need 4 speakers. It is not part of the AHR Expo. We could offer a summary during the GWAC session.

Farrokh R. was also invited to be a panelist on the same session.

Ron B. said there is a possibility of two panels, one more high level. But we can hold off on deciding that until next summer when there is more to talk about. Ron B. is part of the 7.5 committee so he will stay in the loop on it for GWAC.

ASHRAE Panel Opportunity Volunteers: Leonard Tillman, Ron Bernstein, Ron Melton, Farrokh Rahimi

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GWAC Projects

Project	Grid Arch for Regulators	Grid Architecture White Paper	TESC 2022 Conference	Grid Future States	GWAC Blog Content and Review Committee	THE NEXT BIG THING
Scope	Applying Grid Architecture in the Policy & Regulatory arenas	An introduction to Grid Architecture -- including best practices and real-world examples	Annual GWAC sponsored conference focused on Transactive Energy and related topics	Update Grid 3.0 Future States	Decarbonization, GA for Policy	
Audience	Policy Makers	Geared to stakeholders who aren't familiar with grid architecture	Decision makers, solution providers, labs, academics, policy, solution providers	Industry Stakeholders		
Status	On hold until after TESC 2022	Collected inputs and comments from working party members	Complete	Material prepared and presented at TESC 2022		
Actions	Group: Lorenzo Kristov, Larisa Dobriansky, Kay Aikin, Farrokh Rahimi, Chris Villareal, Mark Paterson	Incorporate all inputs and address all comments to finalize draft	Conference Closeout (final accounting, reporting in process RB)	Convert TESC 2022 presentation material into report sections	Group: Kay Aikin, Ahimahz Negash, Larisa Dobriansky, Ron Bernstein, Rahul Bahadur, Leonard Tillman, David Katz, Tim Schoechle, Heather Donaldson	
Leadership	Lorenzo Kristov	Seemita Pal, PNNL	GWAC members on the OC	Ron Cunningham	Kay Aiken	

Grid Architecture White Paper

Seemita Pal noted that several meetings have been held.

Seemita is making updates based on feedback comments, and she is updating the draft. She has met separately with David and Mark to get their input. She will go through it and hopes to have it ready for publishing soon when everyone has commented. She hopes to have a final draft in the next few weeks for GWAC review.

David Forfia offered an update on the Grid Arch Primer from SEPA it is finished but it is not yet published. David got an update from Aaron Smallwood and should be on the SEPA website in August.

Ron Bernstein and Seemita Pal suggested referencing the Primer in the White Paper.

Lorenzo Kristov will restart the Grid Architecture for Regulators meetings again soon. He will start some email with the group this week. He will invite Jeff Morris, not sure about Chris Villarreal, he hasn't been able to attend in some time.

Ron Melton noted that he has been talking with the Chair of the IEEE Smart Buildings Loads and Architecture Sub-Committee about their involvement in future meetings. The hope is to get the committee involved in the organization of the next meeting and they hope to have a stronger tie to IEEE for the next meeting.

Kay Aikin said that Ron Bernstein's blog will go out in the next 2 – 3 weeks.

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Kay won't start meetings again until sometime in September. There are still 4 or 5 more blog posts ready to go.

Ron Melton noted the spot for the next big thing on the matrix is on the horizon and can be discussed at the F2F meeting. This column may be filled out during the GWAC Fall F2F meeting.

Ron Bernstein suggested that the group start discussions soon about the next TESC conference and what topic it should be on. The group also needs to decide on the next big thing for the GWAC; saying that the next big product for the GWAC should be in sight before we start planning a conference.

David Forfia cautioned that the first half of 2023 is already out for the next conference. It would need to be second half of 2023 or later. It takes about 12 full months to put everything together. A conference is a lot of effort by the volunteers.

Ron Melton and Ron Bernstein both noted their agreement to David's cautionary statement.

Kay Aikin said there had been previous discussions about hosting a conference every 18 months rather than annually.



—● Grid FutureState White Paper – key next steps

- Stakeholders' Visions/FutureStates Assessed – mention recent vision/futurestates
- Vision/FutureStates:
 - Similarities /Differences via web/radar chart, Harvey ball chart prepare content for Stakeholder impacts
 - Divergence abstract further from the detailed statements to identify potential topic clusters
- GWAC Insights:
 - Architectural Challenge-gaps prepare trackable content that supports the generalization presented at TESC 2022
 - Industry Grid Drivers / Systemic Issues – Create prose of what was overviewed in TESC 2022
- Complete rest of TOC sections e.g. next steps; Terms/defs; Exec Summary

Grid Future State update by Ron Cunningham

Ron Cunningham noted that writing assignments have gone out to the authors, and they are working on their portions of the Future States white paper. A call is scheduled in the next week.

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Liaison Reports –

- National Institute of Standards & Technology (NIST)– David Wollman
- Electric Power Research Institute (EPRI) – Gerald Gray
- Institute of Electrical & Electronics Engineers Power & Energy Society - Farrokh Rahimi
- American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), CTA, CABA – Ron Bernstein
- International Organization for Standardization, and International Electrotechnical Commission – (ISO/IEC JTC 1/SC 25) Home and Buildings Standards – Ken Wacks
- Interstate Renewable Energy Council (IREC)– Ken Wacks
- Smart Electric Power Alliance (SEPA) – Aaron Smallwood
- Energy Blockchain Consortium (EBC) – Tony Giroti
- Nat'l Assoc. of Regulatory Utility Commissioners (NARUC) – Chris Villarreal

Liaison Reports

EPRI - Gerald Gray announced that he is leaving EPRI on Sept. 2. He will be moving on to Extensible Solutions as a partner, they work on data integration. He will work with Greg Robinson. He will start there by September 12.

Ron B. will present virtually to some EPRI people next week on “GWAC and Grid Interactive Building Takeaways” based on his recent ASHRAE talk this Friday.

Ron A. asked who can take Gerry’s place and he said Sean Crimmins will be taking over as the EPRI Liaison. Gerry noted that Sean leads the EPRI Enterprise Architecture and Integration Research Group at EPRI. He works on Open ADR. He has some CAISO background also.

Ron M. reminded Gerry that he is still a GWAC member regardless of employer. Gerry will find out if his new employer will be supportive. Ron also noted that Liaison attendees do not have to be GWAC members.

Ron M. gave a short summary of IEEE PES GM Denver.

Ron M. discussed IEEE blockchain – future directions of IEEE host new areas for three years and after that they need to join a technical society for support. IEEE Blockchain will graduate at the end of this year. They have a broad umbrella and fit with several societies. IEEE PES declined it and felt it should go under the computer area of IEEE. IEEE Smart Buildings Loads and Customer Systems Technical Committee and the Power Systems Operations Planning and Economics committee have some common turf in load modeling and some of that came up earlier about the ASHRAE opportunities. There are also

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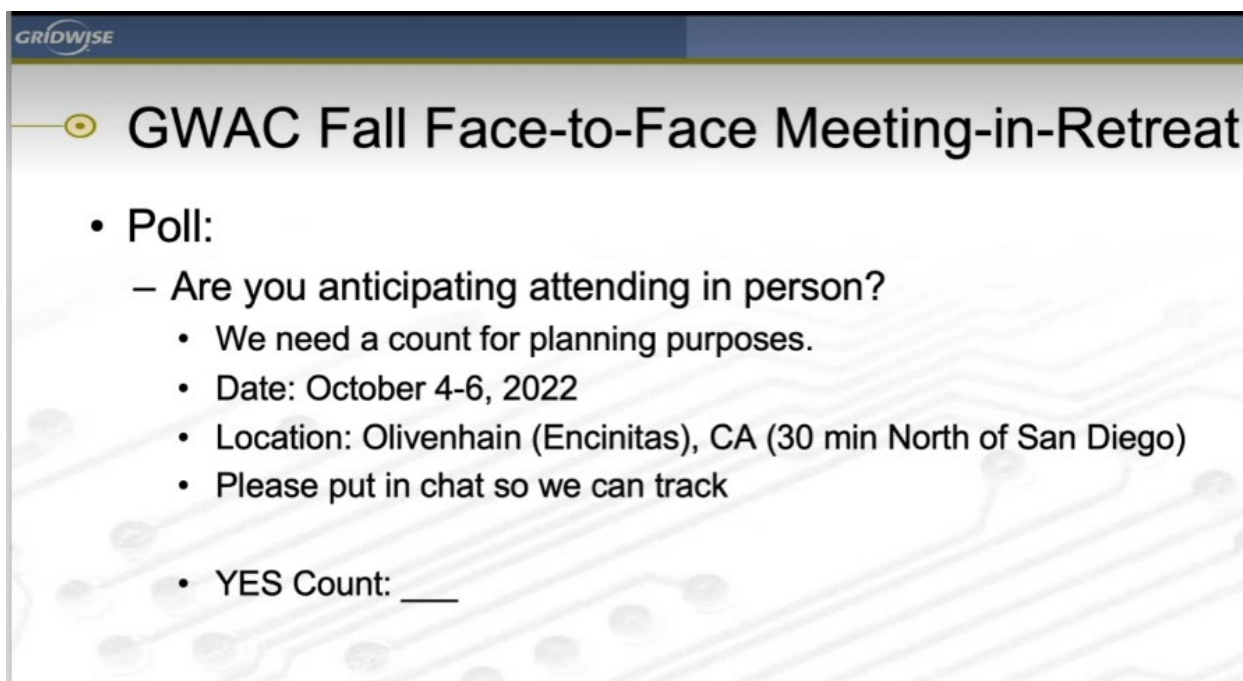
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TE discussions. The Power Systems group like real time pricing and TE and there are some collaborative discussions starting.

Ron B. – Ron will keep GWAC apprised on the ASHRAE collaborative opportunity with IEEE and GWAC. On the buildings to grid side, it would be good to get more people engaged with it.

David Forfia – SEPA had no other updates, just the Primer update previously mentioned.

Ron M. added that the SEPA RE+ meeting will include a working group forum. The TE working group and Grid Architecture working group will mutually support each other and reach out to attendees at RE+ which has about 12K attendees. Each work group gets a 45-minute session, and they hope to have good attendance at each.



The screenshot shows a presentation slide with the GridWise logo in the top left corner. The title is "GWAC Fall Face-to-Face Meeting-in-Retreat". Below the title is a bullet point for a poll:

- Poll:
 - Are you anticipating attending in person?
 - We need a count for planning purposes.
 - Date: October 4-6, 2022
 - Location: Olivenhain (Encinitas), CA (30 min North of San Diego)
 - Please put in chat so we can track
 - YES Count: ____

New Business

If you are planning to attend the GWAC F2F meeting – if you have a better than 50% chance of attending, please raise your hand.

The count came in at about 15 – 20.

The group expressed interest in singing the GWAC song with all the newer GWAC members and associates.

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Upcoming GWAC Meetings

Date	Topic or Speaker	Format	Other
August 17	Lorenzo Kristov – Comparison of DSO Models using Grid Architecture Principles	Web	
September 21	Steve Widergren is invited to present on TE Conceptual Model from the SEPA TE working group	Web	May need to reschedule due to conflict with SEPA RE+ event
October 4 – 6	Topic TBD	F2F	Hosted by GWAC Chair Ron Bernstein
November 16	TBD	Web	Need to send out meeting invite
December 14	TBD	Web	Need to send out meeting invite

Lorenzo Kristov will be presenting to GWAC on Aug. 17. His talk will be based on the presentation that he will give at a CPUC regulatory proceeding soon.

Steve Widergren's talk will be at the September GWAC meeting. The Sept. GWAC meeting will need to be moved because it conflicts with the SEPA RE+ event which will be Sept. 19 – 22 in Anaheim, CA and also with the Clean Energy Ministerial, Sept. 21 – 23, 2022 in Pittsburgh, PA.

<https://gceaf.org/registration/>

Action Susie: Move the GWAC Sept. meeting to Sept. 14 (done).

GWAC F2F San Diego meeting location - Casa De Luz (Spanish for light)

Action: GWAC attendees who have suggested topics or presenters for the F2F meeting, please let Ron M. and Ron B. know and copy Susie.

Ron Bernstein adjourned the meeting. The next GWAC meeting will be August 17.