GridWise® Architecture Council

Meeting Minutes

March 15, 2023

GWAC Members

Ron Bernstein, GWAC Chair and President RBCG, LLC

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

Ron Ambrosio, Independent Energy Transformation Professional

Paul DeMartini, Managing Partner, Newport Consulting

Ahlmahz Negash, Sr. Power Analyst, Tacoma Power

Mark Ortiz, Lead Architect, Schneider Electric, New GWAC member

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

Aaron Snyder, Dir. of Grid Technology Consulting, EnerNex

Leonard Tillman, Partner, Balch & Bingham, LLP

GWAC Associates & Emeritus

Marc Costa, Director of Policy and Planning, The Energy Coalition

Mark Knight

James Mater

Ken Wacks

GWAC Friends

Philip Court

Larisa Dobriansky

David Katz

Tylor Slay, PNNL

David Wollman, NIST

GWAC Members and Assoc. not present

Andrew Bordine, VP Energy Mkts & Innovation, Anterix

Ron Cunningham, IT Enterprise Architect, American Electric Power

David Forfia, Principal Consultant, Utilicast

Rahul Bahadur, Sr. Mgr. R &D, VMWare, Inc.

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

Jeff Morris, Dir. State Gov. Relations, Schneider Electric

Mark Paterson, Managing Dir., Lead Systems Architect, Strategen

PNNL Support

Susan McGuire, GWAC Coordinator

Ron Melton, PNNL Administrator

Jaime Kolln, PNN

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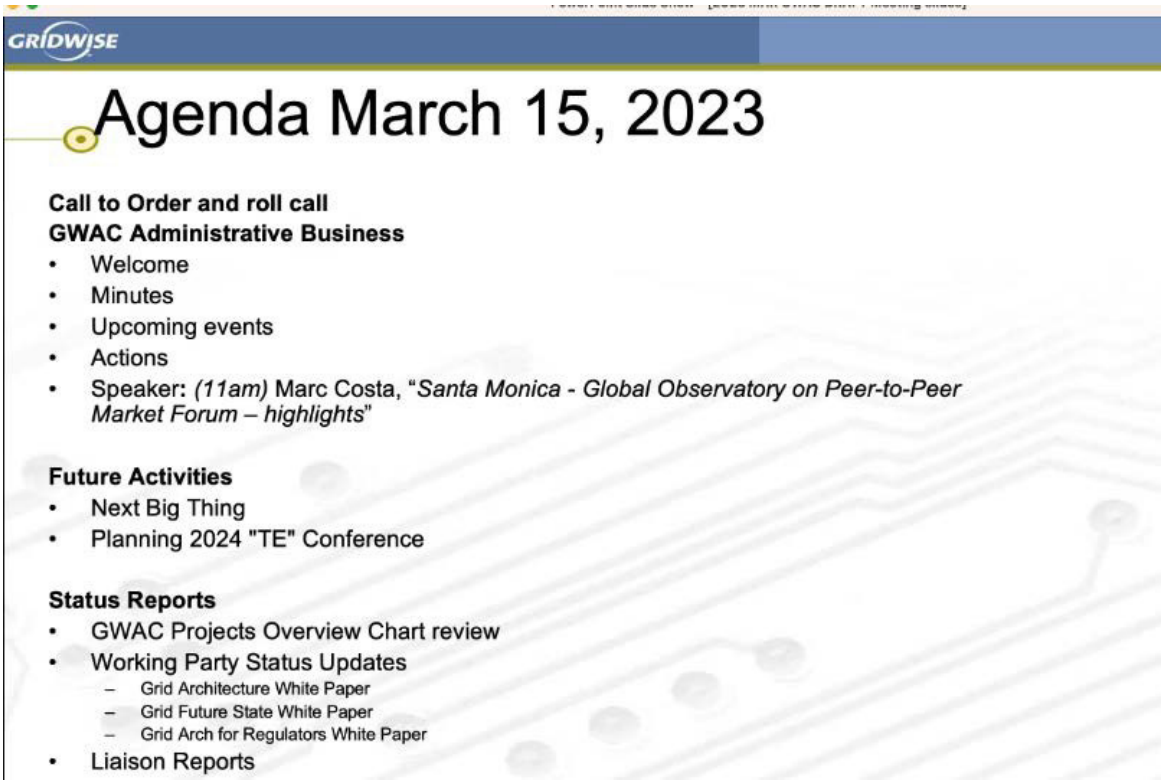

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Introduction

Ron Bernstein called the meeting to order at 10:04am with quorum.

Ron B. asked for a motion to approve the meeting meetings for January and February. Kay Aikin gave the motion and David Forfia seconded the motion. The minutes were approved.

GWAC Conferences

Ron Melton noted that the SEPA meeting on March 22 does require a registration and that can be done on the SEPA website.

Kay Aikin confirmed she is speaking at the Grid Edge conference.

Jaime Kolln said he would like Kay to join the roundtable format for GWAC at GridEdge. The time would be from 2:00pm to 3:00pm. 2 to 3pm on April 11.

Kay confirmed to Jaime that she can make both roundtables

NEEA Efficiency Exchange 2023, May 2-3, 2023, Portland, OR (EFX)

Paul DeMartini will be speaking at GridEdge also with Joe Paladino and Jim Ogle.

IEEE Power & Energy Society General Meeting, Orlando, FL July 16 – 20, 2023. https://pes-gm.org/

RE+ Solar Power International, Sept. 11-14, 2023, Las Vegas, NV https://www.re-plus.com/

T&D World Live, Grid Transformation for an Electrified World, Sept. 12 – 14, 2023, Sacramento, CA. https://events.tdworld.com/

Action: Add Microgrid Conference to conference list, also add the ASHRAE Summer meeting, IEEE PES Orlando, EFX Portland, RE+ Las Vegas and T&D World Live. (done)

Ken Wacks asked to give his Liaison report early due to a conflict:

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Early Liaison report

Ken Wacks IEC/ISO: – The International Standards member nations have approved a revision of the Energy Framework Standard (ISO/IEC 15067-3). Ken had started working on this document twenty years ago. It was published as an ISO IEC standard in 2012 and has been the foundational standard for moving management of energy from demand response programs typically offered by utilities to something more customer focused. This revision enhances the trend by enabling customers to determine the source of their power such as from DER, sited locally, community DER, from an aggregator, from TE or from a traditional utility source. Ken noted that they have provisions in the model to accommodate incentive pricing of electricity, with notices to allow a user to decide how to allocate energy among their appliances, subject to constraints of budgets and their desire to promote environmental or green goals. Choices are up to the customer with assistance from AI-driven automation.

In upcoming meetings, they will work on the second-generation framework. These meetings will begin on May 9.

IREC – At the meeting on March 24 the focus is on a new technology that is being introduced for allowing electric vehicle chargers to be modulated based on radio messages sent. If there is power demand from EV chargers that exceeds the available supply, the chargers can be turned down so that they charge at a slower rate to accommodate power demand. Two companies will be introducing their technology at the meeting. Please contact Ken if you would like to attend.

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GRIDWISE

Actions

- GWAC attendees who have suggested topics or presenters please let Ron M. and Ron B. know and copy Susie.
- Speakers from AHR Expo to record presentations
- Look into getting Michael Murray with *Mission: Data* to speak on Open ADR/Green Button (Mark Costa, Ron Melton)
  - Other possible speakers: DOE EERE, Green Button
- Create a GWAC database of presentations for future talks and a speakers bureau post on the website.
- Create a catalogue of speaker materials with links.
- Add a discussion of the GWAC Mission statement to a future GWAC meeting

PowerPoint Slide Show - [2023 MAR GWAC DRAFT Meeting slides]

GRIDWISE

GWAC Projects

Project	Grid Arch for Regulators	Grid Architecture White Paper	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	Update Grid 3.0 Future States	Decarbonization, GA for Policy	Council's primary focus for the next year – results of F2F meeting.
Audience	Policy Makers	Geared to stakeholders who aren't familiar with grid architecture	Industry Stakeholders	Industry stakeholders, public facing website	Council, Friends, All Stakeholders
Status	Case studies	Collected inputs and comments from working party members	Comments by GWAC Members Overdue	5 blogs released, 2 in queue	Seminar AHR Expo Presented
Actions	Group: Lorenzo Kristov, Larisa Dobriansky, Kay Aikin, Farrokh Rahimi, Chris Villarreal, Mark Paterson	Finalize draft, polish graphics	Respond to Comments from GWAC Members	Group: Kay Aikin, Ahlmahz Negash, Larisa Dobriansky, Ron Bernstein, Rahul Bahadur, Leonard Tillman, David Katz, Tim Schoechle, Heather Donaldson	Record Presenter Videos
Leadership	Lorenzo Kristov	Seemita Pal, PNNL	Ron Cunningham	Kay Aikin	Council

Kay Aikin has been really busy but hopes to get more blog posts out soon.

Ron Cunningham suggested creating a catalog of past GWAC talks.

Ron Bernstein introduced Mark Costa who will present on a meeting that he recently attended.

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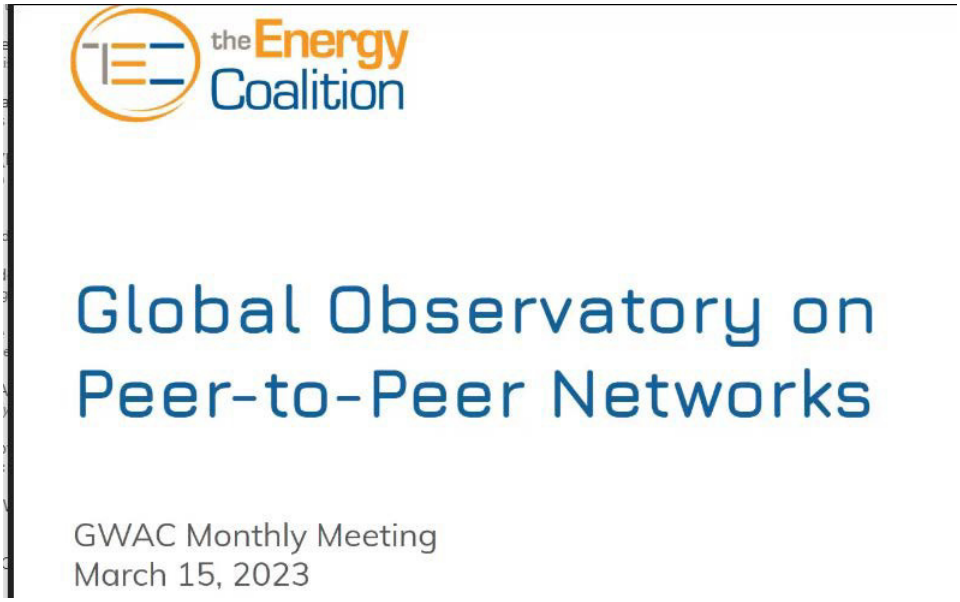

Marc noted that it as a meeting of about 50 attendees: small by design. Eight attendees were from outside of the U.S.

The group enjoyed in-depth discussions about barriers including international perspectives.

Hayden Reeve, PNNL, was there also and gave a presentation.

Reimagine Power rep was there, and they are working with Sunnova on microgrids.

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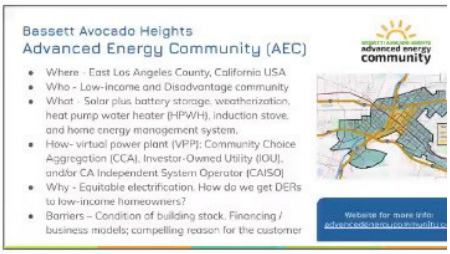
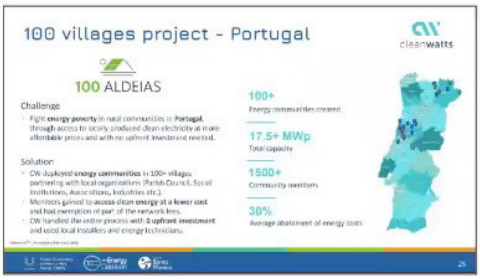
Power Ledger was there – they are a small startup, but they are really doing some interesting things.

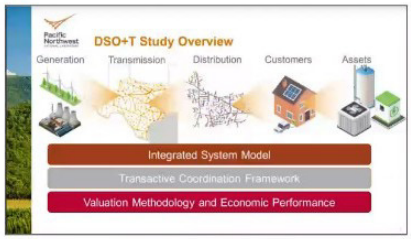
He called attention to a slide similar to the GWAC Stack.

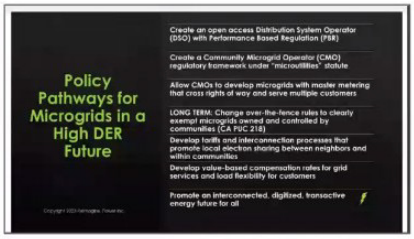
- 2 days
- 50 attendees
- 8 countries
- 10 sessions
- 18 speakers

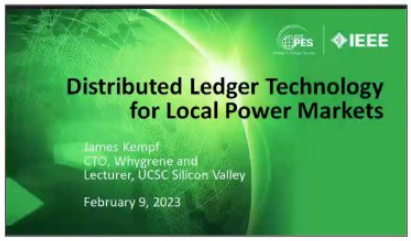




- Regulatory
- Technical
- Fireside Chat
- Town Hall
- Brainstorming
- Activating







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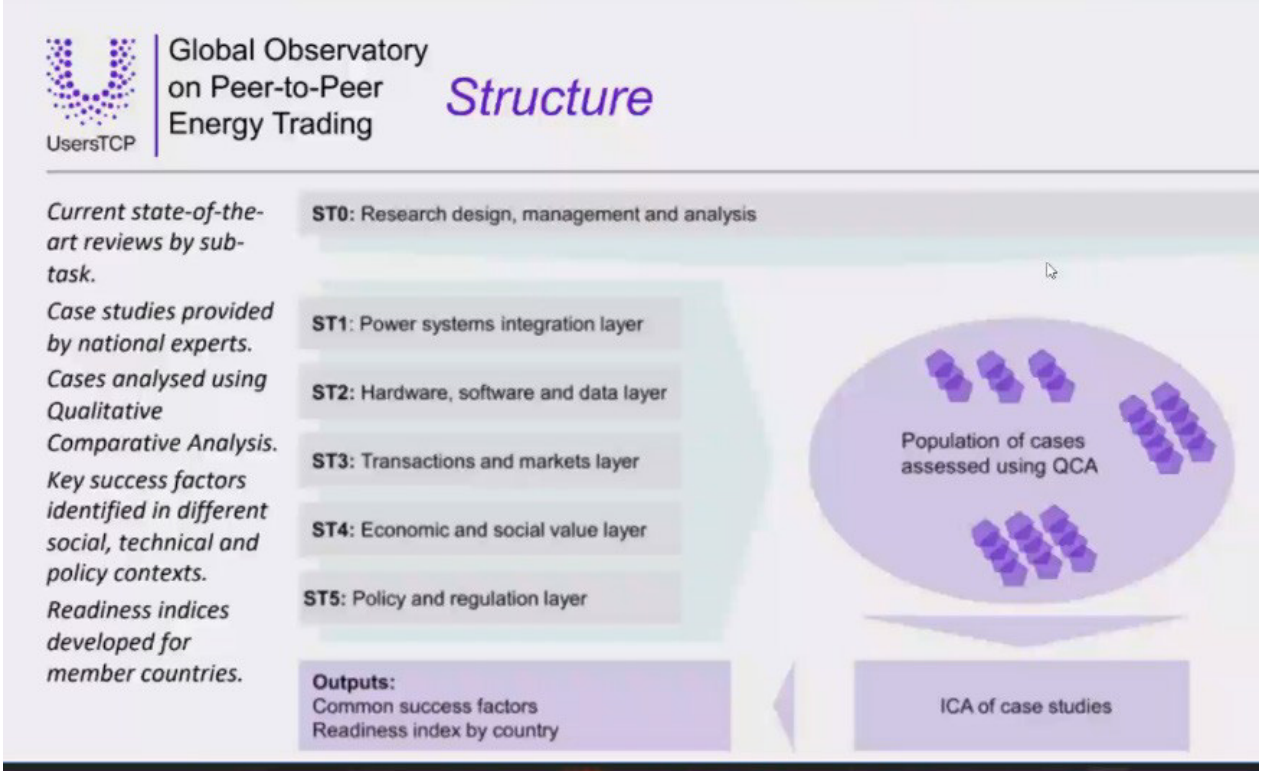

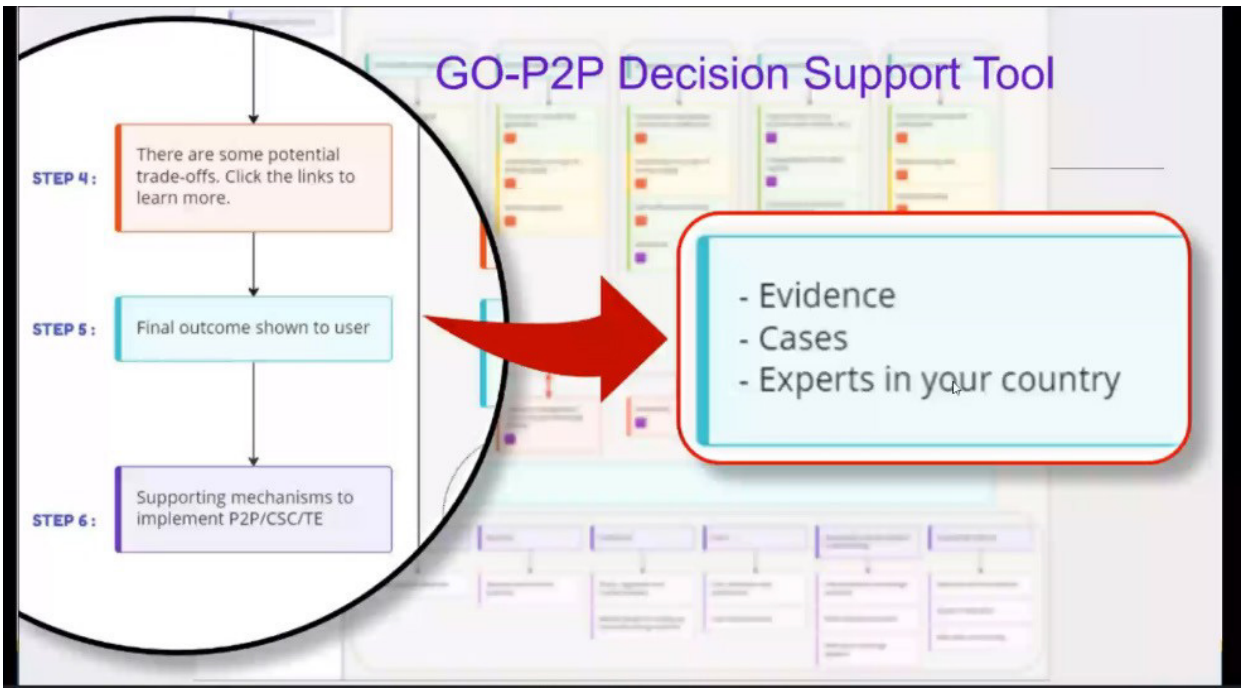

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Marc said that hearing the perspective of what is happening in regulatory with the EU was helpful to him.

AHR Expo review

Jaime Kolln told the group that a GWAC You Tube channel has been created for GWAC AHR video content and the plan is to post links on the GWAC website. Each presenter's AHR presentations will be recorded and available from the GWAC website.

The authors are asked to include a script of their talk.

Once they are posted GWAC can post links to the videos on their own social media sites.

Ron Ambrosio said that the GWAC presenters could link to the channel from their own social media sites

Ron B. said that he has already started working on a recording of the presentation that he gave at AHR. He created a GWAC background for his slides. He will create a slide template for each AHR presenter. He was hoping to have a space on the slide for the presenter and their affiliation.

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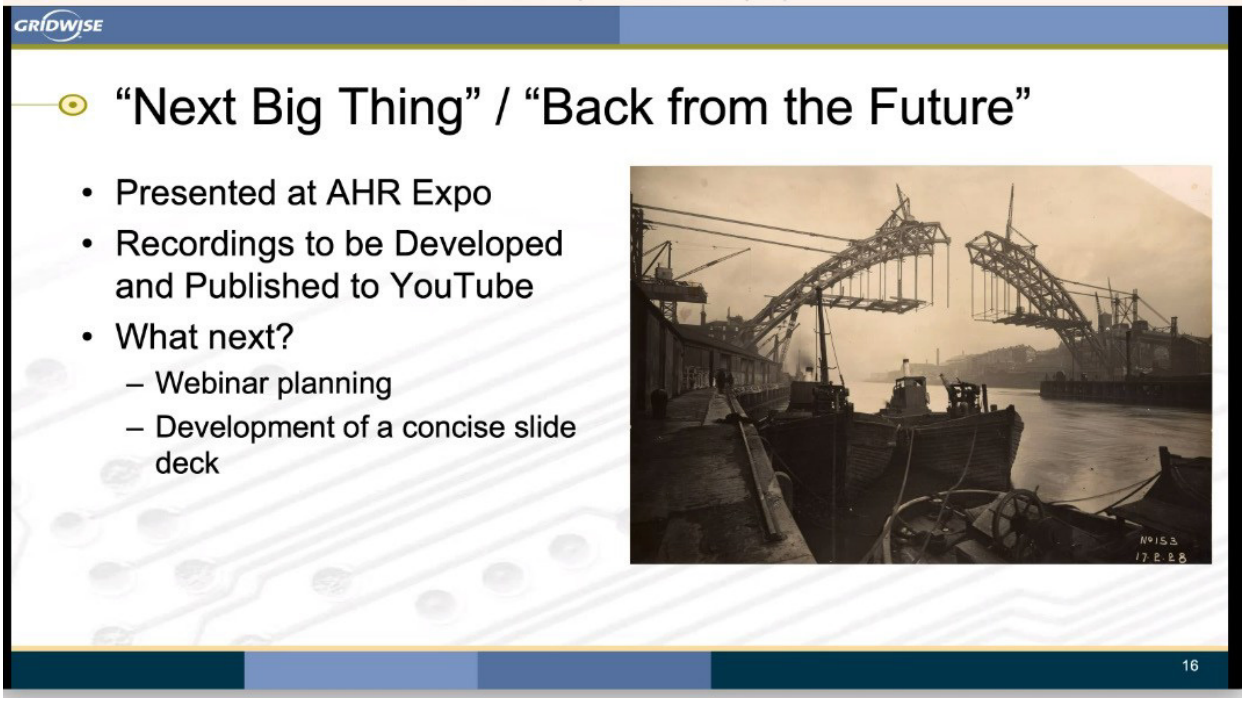


Jaime Kolln has been talking with James Mater about Grid Architecture, Interoperability, and the GWAC Stack. He thought GWAC could create a video that auto makers and regulators might find interesting. He would like to see a video geared toward EV interests.

Ron B. suggested short video with an Intro to GWAC and also the GWAC Stack – to explain what it is and where it came from. This could be an extension to the blog.

Ron M. noted that there are some existing slide decks on these foundational topics.

Ron B. also suggested doing some webinars. Such as Back to the Future as a recorded presentation that could be available on the GWAC website.

Jaime has been talking with James Mater about something like this on Grid Architecture, and the way these relationships are managed. A webinar on grid architecture is a way to present the work we've done in interoperability, the GWAC stack and getting familiarity for people who aren't so familiar with grid interactions. He gave the example of auto makers and their role in the electric grid with EVs and service equipment. So, a webinar directed to that group specifically could be a good opportunity especially with EVs being such a hot topic right now.

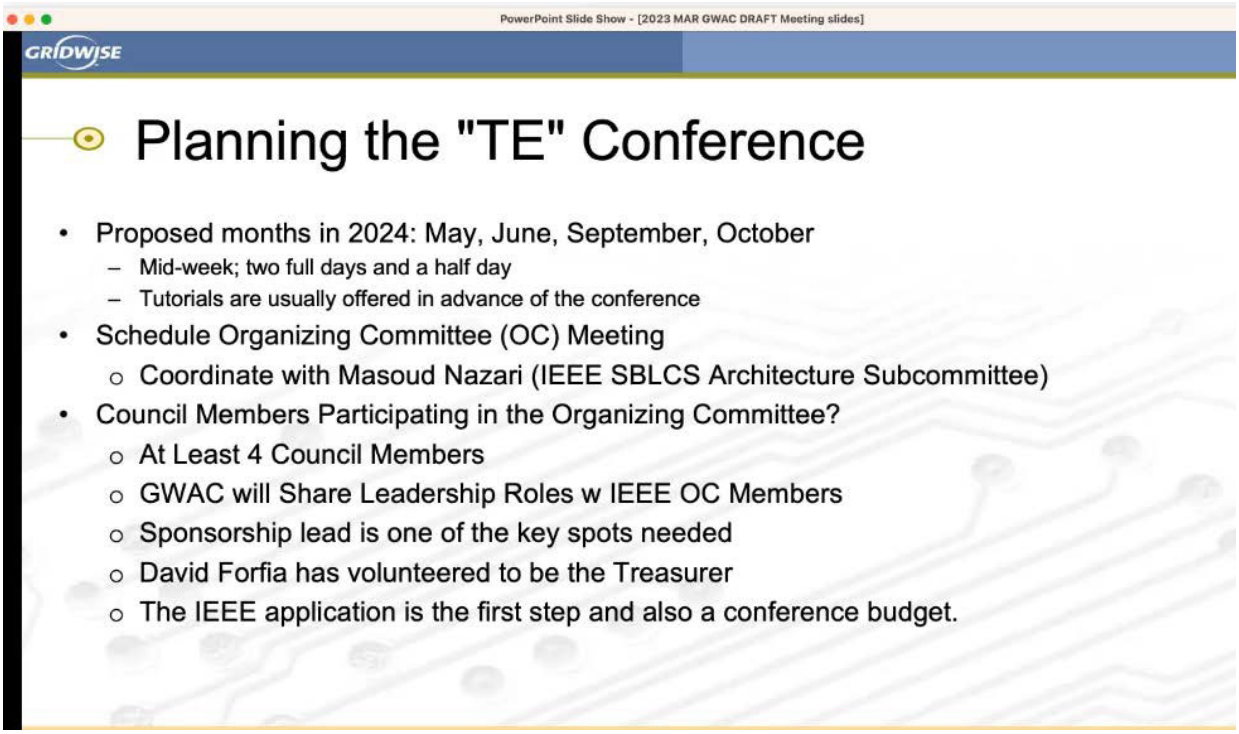
Marc Costa agreed that it would be a great idea. and said he would be able to help open it up to a wider set of people if needed such as with non-profits and industry group. He would be happy to help with promotions.

Jaime mentioned that Chris Irwin with DOE has a vested interest with vehicles. He said currently there is a lack of insight into how grids operate.

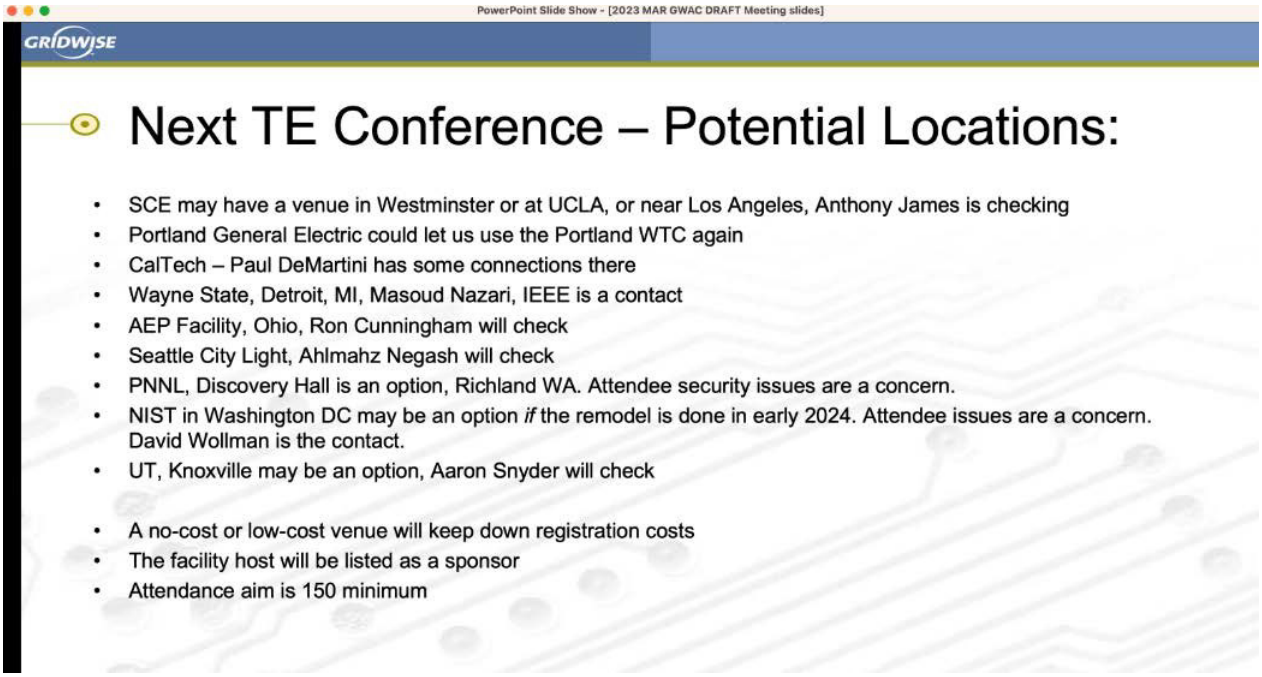
James Mater mentioned a past conference that he held with automakers, charging station operators, and regulators to cover a gap in the ecosystem. There are so many different stakeholders working on vehicle to grid. Just getting people together was very valuable. He had auto industry people, regulators, utilities, and grid operators. They considered opportunities and barriers. He said he saw a lack of coordination among all these different groups working in this space. He said that as SAE was partnering with SunSpec Alliance to build a specific profile and certification program and others who do vehicle-to-grid work. He said there is no central coordination role anywhere.

James suggests that GWAC could help convene different stakeholders and help them to understand each other. In the next few years, it might be really valuable. For people who know auto makers – they don't understand utilities and vice versa. But yet they represent about two thirds of CO2 producers world-wide. He said to decarbonize these groups will have to work together. He said coordination of these key groups should be something that Chris Irwin is interested in.

Jaime agreed and noted relationship diagrams that have been built by GWAC and PNNL over the years. He said that said that everyone wants ownership of the relationship to the owner of the vehicle to have access to it. They symbiotic relationship. It is an architecture concept.



Planning for the GWAC TE Conference



Preferred months for the conference are May, June, September, October 2024. The conference will be two full days and a half day. Also, tutorials are offered in advance of the conference.

Ron Melton noted that the GWAC conference organizing committee will work with IEEE's Masoud Nazari with IEEE PES Smart Buildings, Loads and Customer Systems (SBLCS) Architecture subcommittee chair. The committee will be our primary IEEE representatives in planning the next conference.

Ron M. said it's time to set up an organizing committee. It would be good if we could have at least four GWAC members on the committee. We will share the leadership with IEEE. We will want to transition the conference to IEEE so to do that we will need to engage some non-GWAC IEEE members.

He is also hoping to get some IEEE people to take on some of the leadership roles since GWAC is working toward a transition to IEEE for the conference.

David Forfia has volunteered to be treasurer, and he has confirmed.

Ron M. said that once we have a meeting with the organizing team, including with IEEE people, we can start the IEEE application. We will need to have a rough budget in place to put in the application.

Ron B. offered to be the conference chair, but Ron M. suggested that if a non-GWAC IEEE committee member offered to take that on that we consider them.

Ron B. suggested creation of a new position for an IEEE co-chair. Ron M. said that may not be in the IEEE scope, but GWAC could create the position of Vice-Chair although their authority might be limited per IEEE policy.

Ahlmahz Negash and Ron Ambrosio volunteered to be on the organizing committee.

Conference volunteers - David Forfia, Ron Bernstein, Ahlmahz Negash, Ron Ambrosio so far.

Ron B. asked if we could get IEEE to take on the program chair role with GWAC support. It is a sizeable task.

Ron M. agreed that in that case there should be a GWAC person teaming with the IEEE person for leadership to make sense.

The registration for the conference is done by IEEE and they set up the registration website and collect the funds.

Ron Melton asked Paul DeMartini about the possibility of a conference at Caltech. Paul replied that there are no large facilities there for the conference.

Ahlmahz replied to Ron M. that the Auditorium at Tacoma Power can hold 200 people.

Jaime said that Trevor Hardy is on a work group at SEPA, and that group is willing to provide support for the conference if needed.

Ron M. said they might be well utilized as paper reviewers.

Jamie also noted that he and Susie have been looking into Discovery Hall at PNNL regarding lab policies and pertinent costs (if any) for use of the facility.

Ron A. commented that travel to Tri-Cities is a little more costly for travel. Ron M. agreed that is a consideration, but the group has expressed interest in attending at PNNL.

Paul said PGE in San Ramone may have a suitable facility. He has a contact there and will ask and get back to Ron and Jaime.

David Wollman said that the remodel at NIST is still in progress. He said that NIST has some restrictions regarding foreign nationals, but they should be manageable.

Ron M. said that for the facilities for hosting the conference should include a large meeting room and some breakout rooms. The tutorial and panel sessions would be in separate rooms.

Jaime will follow up with Aaron Snyder about UT Knoxville as a possibility.

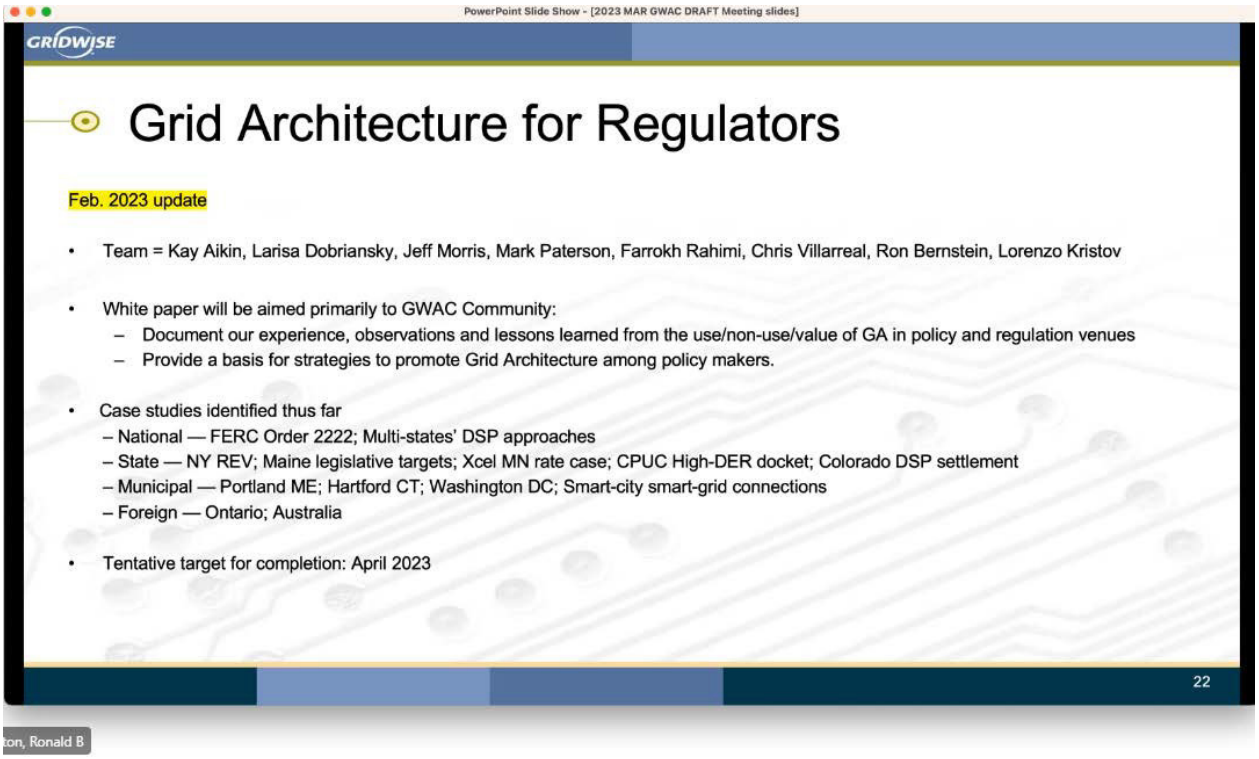
Ron talked about attendance, and he said the last one in Portland and maybe the meeting at MIT had close to 200 attendees.

Ron M. said GWAC will need to start working with Masoud and Roseanne from IEEE very soon.

Action: Schedule a call with Masoud and Ron B. soon to start this process. Jaime will schedule the call. Both he and Ron B. have some time off scheduled in the next two weeks.

GWAC work products

Seemita Pal said that she is planning to send out the Grid Architecture white paper to the GWAC very soon.



Grid Architecture for Regulators

Kay gave an update on Lorenzo's behalf. Two case studies are in.

Larisa Dobriansky is also working on a paper for SEPA which has been taking much of her time. She is working on four use cases but needs to put them into Lorenzo's format.

Ron B. said that he had to switch to another use case, and he is working on that. It may be more theoretical as a design approach.

Kay expects that the paper may be ready by May.

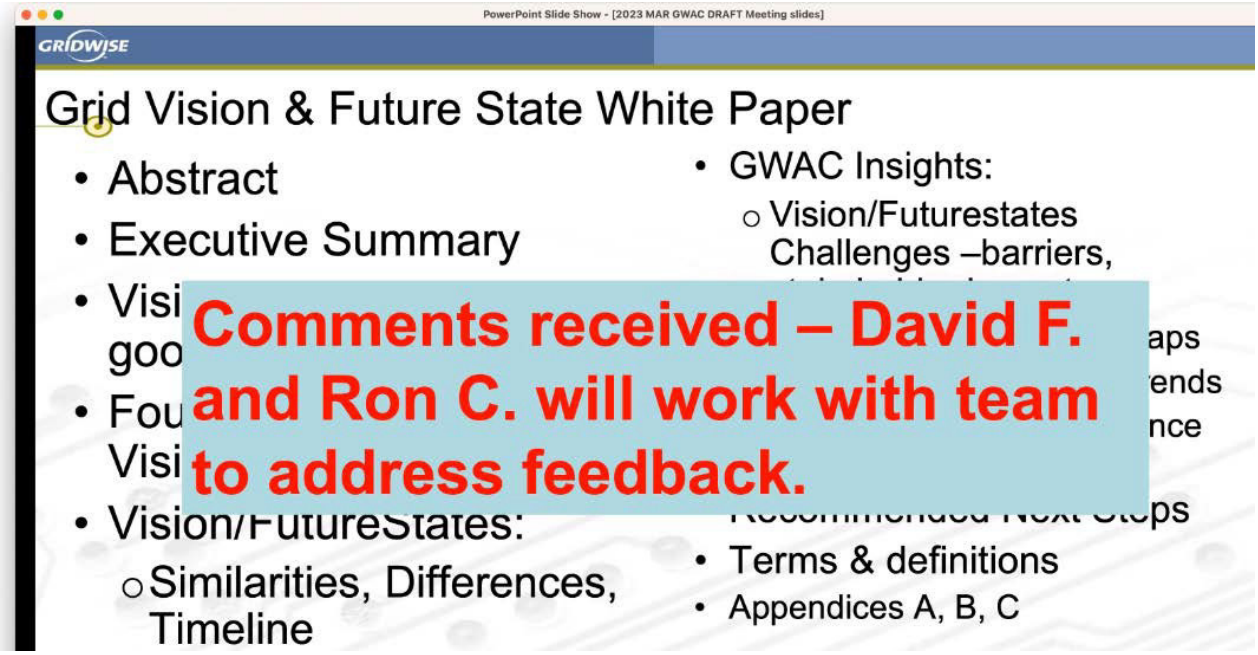
Paul expressed his interest. Larisa said she will share her case studies with him to see if he agrees with what she has.

Paul said his interest would be architecture and market design and he could represent New York and Ontario. Larisa said she he has that work, and she can share what she has with him to get his feedback.

Kay said the use cases are about how Grid Architecture could improve the application of regulation for legislatures and PUCs. The focus is on how grid architecture could have improved the use case described.

David Katz said he also could comment on a use case for Ontario.

Paul offered to talk more with David offline.



Grid Future States Paper

David Forfia is working with Ron Cunningham to incorporate GWAC feedback comments and to edit the formatting, and phrasing on the Future States paper. It will likely come out next Monday for GWAC review.

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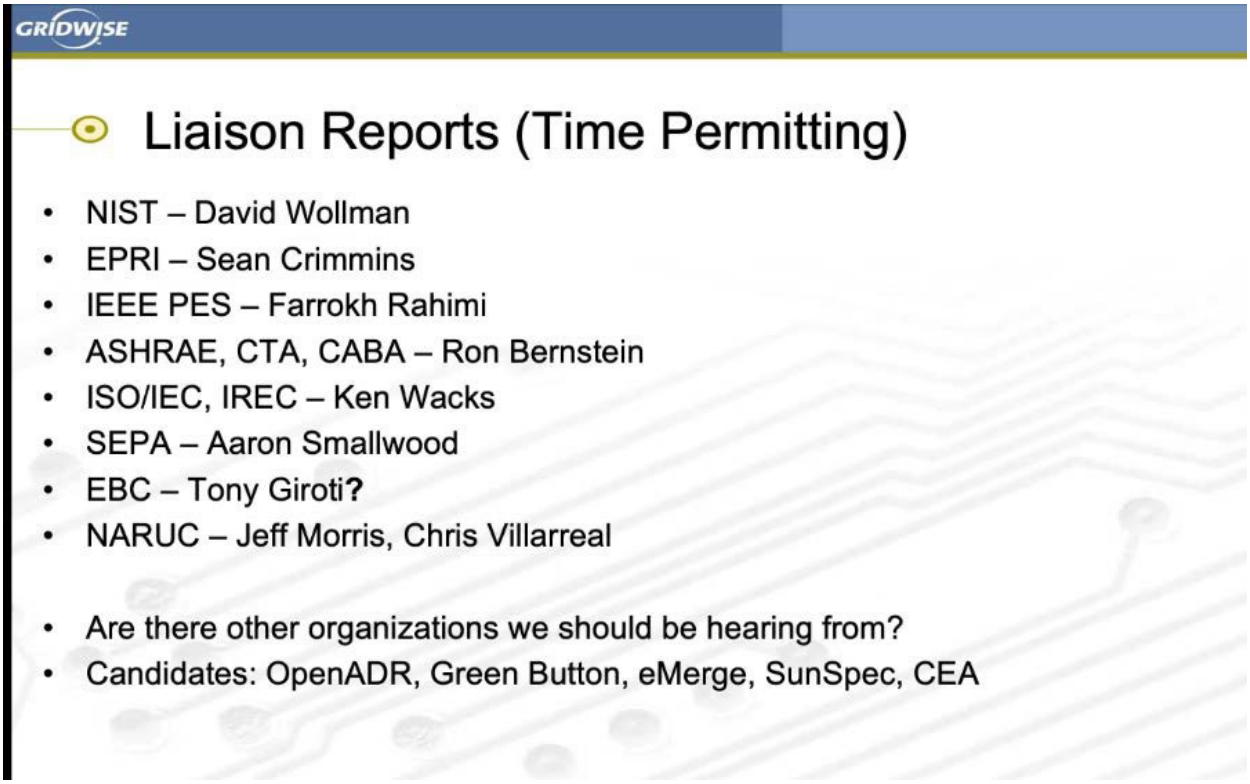

NIST - Dave Wollman: David said he got a copy of the NARUC case study for interoperability for electric vehicle charging out. It can be obtained from the NARUC site. David included a link which will be in the chat links on the last page of the meeting minutes.

Dave mentioned that smart grid funds at NIST have been reallocated recently and Avi Gopstein has moved to DOE.

EPRI – not on the call today

IEEE PES – Ron M. said there is not much to update. He reminded everyone of the general meeting previously noted on the conference slide. He and Farrokh Rahimi are rep the PES on IEEE Blockchain on the Technical Communities governing board.

Ken Wacks – The ISO/IEC committee that he chairs is specifying a gateway between outside communication networks and home or building networks. This gateway will include cybersecurity protections for consumer data, safety, and privacy.

SEPA – Aaron Smallwood was not able to join us today.

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Jaime Kolln mentioned the energy service interface and interoperability profile task force have been exchanging presentations – working with testing and certification to apply ESI interfaces and tools. Some of the work is grounded in GWAC work

Ron M. mentioned a SEPA Grid Architecture group that will meet this Friday. There will be a presentation that will be relevant to the common information model; it may be relevant to either 61968 or 61970 and maybe included in the catalog of standards. It will be on Demystifying the CIM presented by Alexander Anderson, PNNL.

IF anyone wants to attend let him know.

Ron M. said that since Tony Giroti hasn't been attending, we can drop EBC. Ron B. said that Sean Crimmins may be able to update that topic sometime.

NARUC - Jeff is not on today.

James Mater – Open ADR is the process of updating specifications and capabilities to consider almost 10 years of experience in the field. This will allow for better support of open ADR use cases. We will be adding more focus on supporting DER from an interconnection standpoint. Also, 2030.5 is in the process of being updated and will have major improvements. In both cases they should be backward compatible. Both should be finalized this year although it will take industry awhile to adopt them. He noted that IEEE 1547 will kick off in 3 weeks with a new revision.

IEEE 1547 is an interconnection standard that defines functionality and interoperability requirements for solar inverters and battery storage systems and V2Grid related tasks.

Jaime said 1547 is the core standard regarding functionality and "do no harm" to the electric grid when you are connecting assets on the distribution network.

James M. added that 1547 is very detailed, it's over 200 pages and covers electrical safety, temperature tolerances and actual functions. to support grid ops. How to manage things like solar as it connects to the grid. He said to imagine feeders with high penetration of solar and how to add it to the grid without making problems with voltage and frequency at the feeder. It will be supportive of grid operations. It is the core of what California is doing for integrating DERs.

Jaime added that it does have regulatory impacts. As you go through your interconnection work you will be asked to understand at least the basics of 1547. Anyone working on communications or grid edge related assets needs to be aware of some of the changes that are ongoing with that working group.

Ron B. asked if we could get a GWAC briefing on it later on as it is further defined.

Ron M. said it could be an interesting conversation with some standards scope creep between interconnection to operations.

Jaime agreed and said the work groups are trying to maintain boundaries, but it is a challenge. He said 1547 and 2030.5 and SunSpec would be good to include in a talk. They definitely have implications for GWAC.

James offered to do a talk on 1547 and standards involved and how it will affect the grid. He thought it would be a 15-to-20-minute talk.

David Katz said the Customer Grid Edge committee that Ken chairs at IREC hosted a featured speaker on smart inverters. Ken said the slides are posted (the talk was not recorded).

Ken gave the link: https://irecusa.org/wp-content/uploads/2022/11/IREC-CGE-smart-inverters-11-18-22.pdf

Paul De Martini was hoping to find some slides about this. He said that every connected device has some standard related to information and control and then there is some type of communication. How are those for each category of a distributed resource, including EV's, and how do they interface with let's say an aggregation? He doesn't have a view of what happens at the edge.

Ken said it sounds like a PhD thesis.

James said that SEPA inherited information from the Smart Grid Interoperability panel. He said on their website there is something that GE did, and it has standards and links. But he said there is no simple one slide available. James has done something for the EV area and for the solar area although things keep changing. His slide is geared to the U.S. grid industry. It would be on the SEPA website under the Catalog of Standards.

Jaime said depending on how comprehensive you want to be he suggests Francis Cleveland's Grid Interaction slide. Francis describes the standards and what they cover relating to the GWAC stack and the ISO stack. It's his favorite but it is dated now. CTA 2045 is now talked about in regulatory documents and is not included on that slide. But he could get a copy of that slide to Paul. It would need to be cited to her.

Larisa Dobriansky has talked to Michael Murray from Mission Data and Jeremy Roberts from Green Button. They are interested in talking with GWAC. They work in tandem, Mission Data and Green Button. They work on customer authorized info and protocol development. They are working on the IIJA and criteria that DOE is imposing that relates to their work and data interoperability standards.

Ron B. suggested that we ask Jeremy Roberts and Michael Murray to talk with GWAC in the May or June timeframe.

Action: Contact Jeremy Roberts, Green Button and Michael Murray, Mission Data. Jaime and Ron B. will coordinate

James noted that both he and Ron M. have put links to the SEPA Catalog of Standards in the chat.

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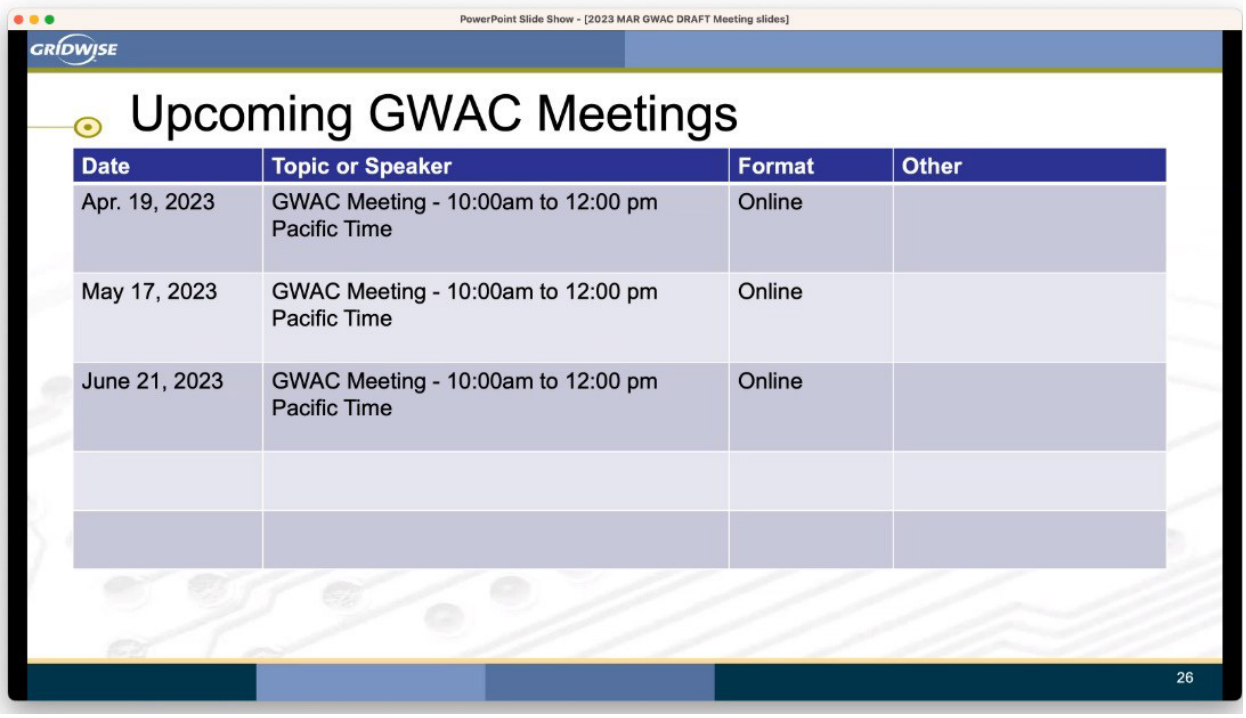
Ken Wacks noted that he is a resource for anyone interested in international standards or American standards. He's happy to assist Paul or others in locating those. He mentioned the modular communication interface also known as ECHO port that is in use by Washington and Oregon.

[Chat links are listed on the last page of the meeting minutes]

Ron Bernstein noted that he will not be able to attend the April meeting.

David Katz said that he has a lead on a possible speaker, and he mentioned a new RFP for Resilience of the Grid Related to Climate Change Issues as a possible future topic.

Ron Melton had asked Anthony James with SCE if he could help get a speaker for April, but nothing has materialized yet. If anyone has ideas for talks at future meetings, please let him know or Ron Bernstein or Jaime Kolln.



11:49am PDT Chair Ron Bernstein thanked every and adjourned

Chat Comments with Links:

https://www.nist.gov/publications/considering-interoperability-electric-vehicle-charging-commission-case-study

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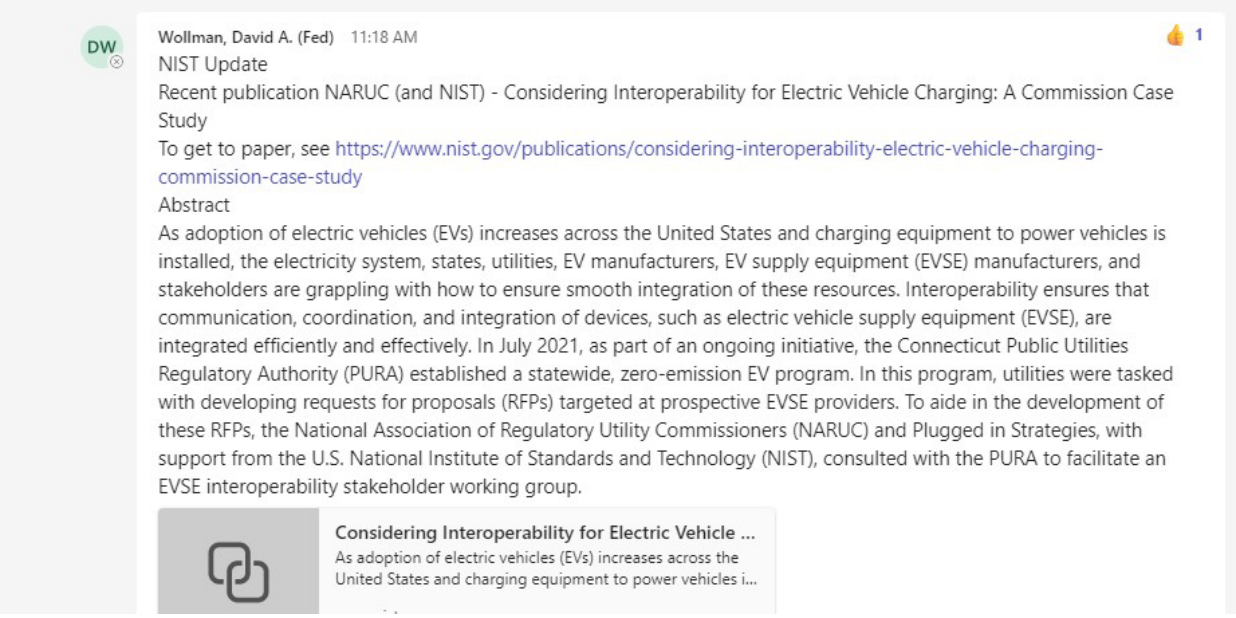
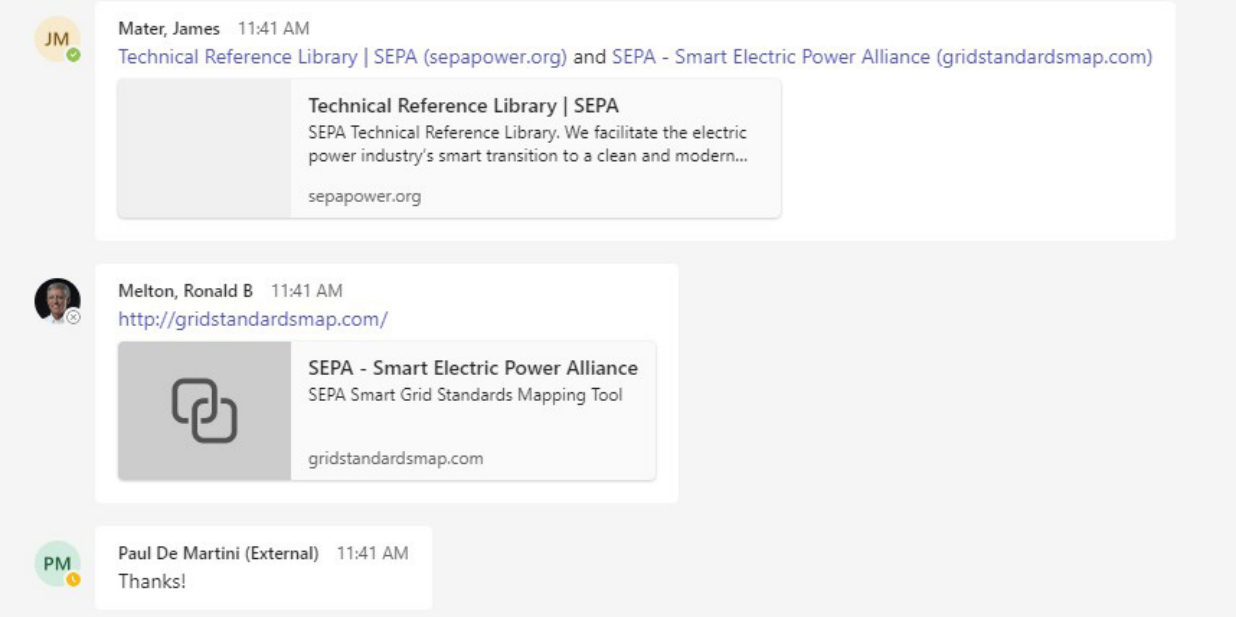


https://sepapower.org/knowledge/technical-reference-library/

http://gridstandardsmap.com/



Meeting Minutes

March 15, 2023

Ron M.: IEC Map tool

https://mapping.iec.ch/#/maps/1