Meeting Minutes

November 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

Andrew Bordine, GWAC

Ron Cunningham, IT Enterprise Architect, American Electric Power

David Forfia, Principal Consultant, Utilicast

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

Ahlmahz Negash, Sr. Power Analyst, Tacoma

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

Amro Farid

Amara Fatima

Alex Ghanem

Anthony James

Stephen MacDonald

Hayden Reeve, PNNL

Jeremy Roberts

Aaron Smallwood

Tylor Slay

PNNL Support

Grace Borland, TSP Project Coordinator

Jaime Kolln, PNNL Administrator

Ron Melton, PNNL Administrator

GWAC Associates & Emeritus

Marc Costa, Associate

Ken Wacks, Emeritus

GWAC Friends

Hawk Asgeirsson

Shawn Chandler

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Agenda Nov. 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

Future Activities

- · Planning 2024 "TE" Conference
- GWAC 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
- Liaison Reports

New Business

Jaime Kolln opened the meeting. He noted there is no speaker today and reviewed the Agenda. He reminded the GWAC that the Call for Candidates is open. We will talk about the Next Big Thing, planning the next GWAC Conference that may or may not feature Transactive Energy, and also the spring F2F meeting options, Jaime also will discuss where we are at with the strategic outreach plan that was started at the October F2F meeting and we will have an overview of the word products.

New Participants

Jaime invited anyone new to GWAC to introduce themselves.

David Forfia encouraged him to attend. He previously worked with TeMix Inc. on project development.

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Stephan McDonald Introduced himself. He attended today at the encouragement of David Forfia. Stephen said he is looking to illuminate the GWAC on a different perspective regarding actual real field demonstrations which he hopes they will be excited about. He considers it the one glaring issue that is not really discussed – the value of demonstrating Transactive Energy. He looks forward to bringing that perspective.

Hawk Asgeirsson Introduced himself, he previously worked for DTE Energy in Michigan. He has gotten involved in standards work particularly in energy storage and vehicles. He hopes to see more information be available in real time.

Jaime worked with Hawk to organize the V2G forum in Detroit.

Sean Chandler introduced himself. He has been in the grid industry for about 30 years. He has worked with Ron Melton on standards development. Currently he is a director at Guidehouse where he is a director in the West Market group working with large utilities, government, and industry clients.

With IEEE he was the chair of the Interoperability Task Force for the Blockchain Initiative, a new standard that will be coming out P2418.5. He's been working on that a lot in the last three years. He's now involved in the recently launched IEEE 2030.14 effort for virtual power plants.

September GWAC meeting minutes

Ron Bernstein said he has reviewed the September GWAC minutes and had no edits.

Ken Wacks said that he had called in some edits to Susie.

David Forfia made a motion to approve the minutes as amended. Ron Ambrosio seconded the motion. The September minutes were approved without any objections.

Action: The September meeting meetings were approved as amended.

Ahlmahz attended Grid Forward this year. She said Microsoft had a good presentation about AI in general; it's shortcomings and potential. She said overall it was a great conference.

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GRIDWISE Architecture Council Conferences and Events

Date	Event	Location	Attend	Speaker	Topic
Oct. 16-18, 2023	GridFWD	Skamania Lodge, Columbia River Gorge	Ahlmahz Negash	TBD	Grid Modernization – northwest region
Oct. 17-19, 2023	V2G Forum	Detroit, MI	Jaime Kolln, James Mater		Accelerating V2G in the emerging V1G charging standardization regime.
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
Sept 9-12, 2024	RE+ Anaheim, CA & GWAC Conference	Anaheim, CA			

Conferences and Events

Ahlmahz attended Grid Forward this year. She said Microsoft had a good presentation about AI in general; it's shortcomings and potential. She said overall it was a great conference.

Jaime mentioned that he was a panel organizer at the V2G Forum. There were two tracks. He didn't get to attend much of the policy meetings. He chaired two panels. He moderated two panels. The first one didn't have much time for questions and discussions. The second one had a lot of engagement. For end-to-end testing for V2G – this doesn't exist. The challenge lies where vehicle standards end, and IEEE standards begin. He said he sees this as the biggest barrier and added that bridging between the two is tricky; there are a lot of plug fests but no end-to-end charging. And also, no end-to-end testing and certification.

Jaime also noted that certificate management and how utilities deal with certificate management, seems to be a big challenge. We identified with the 2035 Steering Committee, which was part of the interoperability maturity model work of the Council, and that identified that there were no single certificate entities, that managed the certificates. Sunspec took that role on for California.

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But that doesn't exist in V2G, and so the utilities are talking about the 60 plus certificate management methods that they have to be able to interact with. And the challenges associated with that.

Stephan MacDonald was also attended V2G in Detroit and gave a panel on TE for designing TE tariffs. It was a cross functional panel of both software standards for the 2039.5 representation. The conference also had a DTE representative thanks to Hawk.

The automakers want the business model. Several have created a company for grid services. They want to demonstrate the business case now.

That's what Stephan sees it as really wise to continue to push demonstrations and continue to push the industry to showcase the value DTE conversation about transactive energy hurdles for them.

Jaime invited Stephen to present his V2G presentation to the GWAC at a later date.

Ken Wacks attended the Parks Associates Smart Energy Summit last week. There was a poll done of the meeting audience about energy storage and most people felt that the automobile will supplant the standalone the battery that Tesla and others are selling. He asked Jaime about his observation at the V2G forum, if most people have come to agreement that they will support using the vehicle battery for non-vehicle applications?

Jaime said based on the V2G attendees, there is consensus that there is an opportunity that they don't want to miss. Jaime said the biggest challenge he finds will be motivating participation. So maybe TE has a role there, but there also needs to be some level of understanding of the grid by automakers, customers, and utilities.

Ken clarified that he meant between the car and the equipment, appliances, consumer electronics in a home.

Jaime said yes so that would be vehicle to building. He said that there is consensus that that is value for that as a backup generator. He said the trickier part will be vehicle to grid. And also, if they want to use it as a support system to the grid, they're going to have to compensate or figure out a way around that. So, there will be a lot of communications protocol needed.

Jaime introduced Farrokh Rahimi who recently attended the ISGT Latin America.

Farrokh attended the meeting in Puerto Rico and Lorenzo also attended. They had a panel on decentralized generation which Lorenzo was a part of. Farrokh also held a session on Microgrids and

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Resilience. Attendance was impressive with more than 700. He was very happy with the way it was conducted.

Lorenzo said he enjoyed the meeting.

Ron Melton noted that the IEEE PES general meeting is missing from the Conference slide.

Action: Add the IEEE PES General meeting to the conference list

Marc Costa also said that he will attend the International Energy Agency Global Observatory Peer to Peer Energy Markets at TU Delft Tech Univ in Delft/Rotterdam. It will cover topics related to GWAC including transactive energy and grid management. He said they don't have a web page, but he will give a report about it later.

Marc also noted a UN meeting in Oct 2024 on the Building Action Coalition which Kay has also been involved in. They are trying to represent the grid angle. It should be held in California, but the location is not announced yet. Marc is hosting the meeting. Marc suggest that someone, possibly Kay give a presentation as a representative of the GWAC.

Hawk A. noted that there will be another V2G forum will be held in CA April 30 – May 2. And a fall meeting in October, on the east coast, possibly Detroit again.



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_bvlaw.pdf

Jaime reminded the group about the upcoming GWAC Call for Candidates.

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GWAC will choose at least one new member. Applications are due December 15. The application and by laws are available on the New Candidates section of the website.





Jaime noted the GWAC constitutional convention photo on the GWAC Accomplishments slide. Ron Ambrosio noted that he was at the original signing and Jeremy Roberts with Green Button also noted that he was there, and he was a signor.

Ron Melton held up his copy of it on camera. No one was sure where the original document is.

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"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



Webinar for the "Next Big Thing"

Jaime said this product has come out of discussions at the October F2F meeting around the AHR GWAC Panel presentation and the related video which Ron Bernstein has compiled into one video of all the GWAC presenters.

At the meeting Rahul Bahadur and Ron Ambrosio volunteered to put together a committee and create a webinar on the next big thing. Jaime asked them to set up a recurring meeting and asked to be included although cautioned that he didn't have a lot of time for it. He asked them to also think about how they would like the video to look on the GWAC website.

Ron Bernstein said he would be happy to be a part of this work group as well.

Ron Bernstein said it could end up being more than one work product perhaps with an overview piece as well and then a more detailed piece. He said that some of the individual slide decks from the AHR GWAC presentation were very detailed and could lead to some follow-on products.

Jaime said that the committee's decision might determine how we set up the 2024 Conference website as well.

GWAC 2024 Face to Face Meetings

The next GWAC F2F meeting will be April 16 - 18, 2024 and then a September 2024 Fall F2F is proposed.

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Farrokh has given us a formal invitation from OATI for the Spring 2024 meeting. Jaime said that Ron Bernstein has been telling him about the Microgrid at OATI and it would be a great tour for the group. Some toured the microgrid in 2018 after the GWAC Conference in 2018.

Ron Bernstein asked about a meeting at Marc Costa's office.

Jaime asked Ron Bernstein to formally accept the invitation from OATI.

Action: Ron Bernstein to confirm GWAC acceptance of the invitation for a F2F GWAC meeting at OATI – Minneapolis, MN in April 2024.

Ron Bernstein asked about holding a Fall F2F at the invite of Marc Costa at the Energy Coalition Offices in Irvine, CA.

Marc replied that he thought that would work, he would need some information about dates and times and expected attendance.

Jaime said it would be after the GWAC Conference at RE+ in September 2024.

Some discussions about this clarified that it would be a shorter F2F, perhaps only a half day meeting.



GWAC Face-to-Face

- Discuss next F2F meetings for 2024
 - Spring meeting planned for April 16 -18 2024
 - DC, PNNL, NEMA, San Diego, NRECA, OATI, Schneider
 - 20th Anniversary
 - September 13
 - Casa Bernstein, RE+?, Energy Coalition

Jaime said he was thinking of a short Face to Face meeting just before or after the conference. Ron Melton said that RE+ should be able to provide a meeting space for a short, typically half day GWAC meeting. Typically, it would be just before or just after the conference.

For the April meeting, the dates that have been discussed are April 16 - 18, 2024. Farrokh said that OATI can accommodate 25 to 30 people. Ron Bernstein recommended that we poll the GWAC to see who plans to attend.

Kay Aikin and Marc Costa may have a conflict with a meeting to be held in Dublin, Ireland.

Action: Do a poll to see which GWAC members and associates plan to attend the F2F meeting at OATI.

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GWAC Strategic Outreach Plan

- · GWAC Mission statement
- Set up recurring "strawman" Task Force More Discussion Coming up!
- 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 have volunteered, more names are needed!
 - · Development of a concise slide deck
 - · Web Page with details including GWAC activities

Jaime asked about the strategic outreach plan and said it needs to include the mission statement and it needs to include how we will frame up the next step of the Council's work.

At the October F2F Mark Paterson had suggested that we "follow the money" as part of the Outreach plan. Jaime is hoping to get Council feedback on what the outreach plan activities should look like, not about the plan itself but what we need to do. We will need a volunteer from the Council to lead the strategic outreach planning group.

Ron B. suggested a call to discuss this more in detail.

Jaime asked who would like to be on the call. Ron A. asked to be on the call and Ahlmahz agreed to join the group as well.

Acton: Jaime to send an invite to the Council for the Strategic Outreach meeting.

Grid Architecture White paper update

Seemita Pal said that review feedback suggested that the Grid Arch paper should be made a bit more contemporary.

She also said that for this paper and the Future States paper a new cover page is being developed by PNNL communications specially for GWAC publications.

Jaime added that it will be a new white paper template. He is working with PNNL Communications and after feedback from the Council, the parts of the GWAC star are being reassembled to avoid a linear impression. The refresh is in-progress.

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Grid Vision & Future States White paper

- Applying PNNL Pubs norms/standards for acronym/trademark usage to whitepaper and adjusting graphics sizing/image types to better normalize whitepaper page orientation with text flow.
- Will provide a candidate version for final edit review ahead of GWAC Nov. 15th meeting. This includes a revamped "about this document" section.

Grid Vision and Future States Paper update

Ron Cunningham noted that he sent the current paper out to the GWAC earlier this morning and would appreciate any feedback.

There is a correction in progress which he noted in his email to the GWAC.

Ron also noted that the length of the paper is too long now to be called a "white paper."

Ron said that he has gotten some questions recently about the difference between the GWAC and the GridWise Alliance. He created an about the Council for his paper and has asked the Council for their feedback.

Stephen MacDonald asked to share something about a TE mapping exercise that he is doing for SEPA. He explained that his effort is for a SEPA work group. They will be trying to map the big value in this industry. He would like to bring his effort to GWAC for their input. He feels that GWAC and SEPA are world leaders on this topic.

Stephan has experience with Intel developing a system architecture that does all the software layers, it is an architectural schema for software defined networking. He'd like to find the synergy line and be able to demonstrate it.

Ron A. said it's not so much a different vision, but GWAC now has a different focus noting that TE is one thing that can be implemented in Grid Architecture as noted in the paper by Ron Cunningham. He said the particular paper that Ron Cunningham is leading is centered around grid architecture more generally and the kind of tools that can be used. He suggested that Stephan have a conversation in the SEPA Grid Architecture Working Group, and he said Ron Cunningham and Ron Melton co-chair that group.

Ron Cunningham said that for the Future States paper he needs to shore up some of the citations that have aged out over the last six months.

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Jaime asked if he would like some help with that task from PNNL staff.

Grid Architecture for Regulators

Lorenzo needs to turn around the next draft, however he has been busy working with regulators. He said it is up to him now and he won't really have an update until he gets some more time to work on the paper.



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 interest: Costa, Ambrosio, Forfia, Aikin, Kristov, Rahimi, Paterson
- •2PM PT/ 5PM ET Thursday 2 times 1st and 3rd Starting Nov 2nd

Grid Architecture Concept Model for Interconnection, Electrification, and Decarbonization

Analyze various visions of the electrification of fossil fuel-based systems and identify areas where GWAC concepts could provide architectural value to bridge and coordinate between customer and grid objectives. Electrification will introduce dependencies such as those seen in the transportation sector due to electrification. Grid Architecture will be used to describe the touchpoints (for example through sector coupling) that will require collaboration. GMLC reference cases will be included. The majority of this activity will take place in FY24 and be completed FY25.

- •Committee interest: Cunningham, Rahimi, Ortiz, Forfia, Snyder, Kristov, Pal, DeMartini
- •1PM PT/ 4PM ET Tuesday November 28th

Jaime said the group has met regarding the first new white paper and the meeting for the second paper is coming up. These groups will be meeting twice a month. Jaime asked if anyone would like to participate in the meetings about these two new papers, they are welcome to do that, please contact Jaime.

For the first paper Jaime is looking for someone to lead it or possibly he may appoint someone from PNNL to lead it. For the second paper he plans to be involved and possibly co-lead that effort particularly on transportation electrification.

Lorenzo said the title of the paper in the meeting appointment confused him. Going forward Jaime will rename the meetings for the first paper to match the title on the slide.

Ron Bernstein asked to be copied on the invite to both meetings.

Jaime will invite GWAC to both meetings until the teams are fully formed.

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Liaison Reports

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

David Wollman is not able to attend today.

Jeremy Roberts – Green Button: Jeremy said November 1 was a mandated deadline for Ontario and 55 of the 57 electric and natural gas utilities met the deadline and the other two are close to meeting it. Since his presentation they have gone from 75 to 130 utilities meeting the Green Button mandate.

There is a new NAESB REQ Standard 21SB – Energy Services Provider Interface. It will be version 4.0. There is now a transport layer security TLS 1.3, and they have added the ability to share customer bills in PDF format through the connect my data method.

He said Green Button will again be opening up the Annual General Meeting to members and non-members alike. It will be all virtual and is scheduled for two hours. It is scheduled for December 7. Feel free to register if you would like.

IEEE – Ron Melton – there is not a lot going on right now. ISGT North America is coming along with Farrokh as the chair and Seemita as the Co-Chair. It is the week of Feb. 19, 2024, in Washington DC.

Ron M. also reminded the group that there are various committees and sub-committees and also task forces in IEEE, not just in the Power and Energy Society but also in the area of electric vehicles, transportation, and electrification. If you would like to know more, please contact Ron Melton, he'd be happy to forward information and Jaime Kolln also has good information about IEEE.

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Ron M. noted that Mark Paterson has joined the meeting.

Jaime Kolln would like to talk with Mark P. about some activities that he may want to participate in.

Action: Jaime to schedule a meeting with Mark Paterson.

Jaime asked Ron Melton about SAE activities within IEEE and Ron M. said he wasn't sure what activities might be related to that topic.

Ron M. noted that the IEEE technical community is active in the area of block chain and the IEEE technical community is open to any IEEE member to join. There are various organizing meetings and groups located around the world.

Ron Bernstein – there is an ASHRAE meeting that is part of building automation and controls and building interactions with the grid. The interoperability of metadata is one thing they focus on. It is about low-level details regarding information between systems and sub-systems where the data has some need for standardization. Some third parties are working on this. There is a push for a combined standard that the US Army Corps and DOD are looking at. They sent out a survey recently and they are looking for industry feedback about the future of Interop and data sharing between systems down to the nuts-and-bolts level. Contact Ron Bernstein if you would like to know more.

Also, another area they focus on is the segmentation and Cybersecurity of control systems throughout the built environment, including smart cities, smart buildings and how it relates to building to grid and V2G at some point as well. There is a next generation of cyber standards.

Also, there are standards for graphic visualization of control systems and the control environment across grids and across industries. What would work from the perspective of an operator's psychology from various vendor platforms. The objective is to work to create uniformity between platforms that can be easily understood. For example, how to set up sequences of operations with a visual that can be easily understood with standardization across platforms.

Action: On the conference slide change CABA to ASHB (done)

Ken Wacks - ISO-IEC an international standards group. ISO and IEC collaborate on IT standards.

Ken's committee had a plenary meeting last month in Berlin. Countries from the Americas, the EU, Asia, and Australia participated. Ken was re-elected to serve as chair on the Home and Building Systems Committee for another three years.

During the time he has led the group they have produced about 60 standards and technical reports.

Ballots are out now on an energy framework where they are shifting from an emphasis on utility centric to consumer centric in support of Distributed Energy Resources which is wind, solar and storage so that the consumer has control over it. They have a series of standards also out for ballot to add cyber security protection for consumer data safety and privacy to the gateway which is the gateway to the

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premises and the outside world. They are also working on development of an interoperability lexicon based on work that was initiated about 20 years ago by GWAC's own Ron Ambrosio.

Ken Wacks – IREC. Ken said the group hosts about two guest speakers each month. The talk this Friday will be by Dr. Trevor Hardy, PNNL on "Transactive Energy – Empowering Consumers." It is the second of two talks by him on this topic.

For more information about ISO/IEC and IREC please contact Ken Wacks.

Jaime Kolln noted that Aaron Smallwood is not on the call today for SEPA.

Jeff Morris is not on the call to review NARUC activities.

Mark Paterson said he might be able to get some GWAC speakers to give updates on what's happening in Australia and the building interactions with the UK.

Jaime liked that idea and asked Mark to send him an email with more detail on those speaker opportunities.



Ron Bernstein said he has some ideas for speakers from the two people who were not able to attend in October.

Ron B. and Jaime will discuss a plan for back up speakers in the future.

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Jaime thanked Tylor Slay who has created a list of broken links on the GWAC site.

Ron B. will not be able to attend the December meeting. He asked David Forfia and David will try to cover the meeting Chair or if he is not able to Ron Ambrosio offered to cover the December meeting.

Mark Paterson said the Future Grid Accelerator is a global, shared platform. There is a simple animation from a linear system to a much more interdependent power system. Once it is launched, he will send a link so that the GWAC can take a look.

Jaime said he would like to schedule a follow-on meeting with Mark and the GWAC to talk more about marketing outreach that we discussed at the October F2F meeting. Mark had some ideas about marketing outreach that would be good to talk about more in depth.

Action: Jaime to schedule a working meeting on GWAC marketing outreach with Mark Paterson and GWAC.

Adjourn

Ron Bernstein thanked everyone for the good discussions today. He wished everyone a good Thanksgiving and adjourned the meeting.

Next meeting is December 13, 2024