Meeting Minutes
Sept. 18, 2019

GWAC Members

David Forfia, Director, Enterprise Architecture & IT Transformation, Electric Reliability Council of Texas (ERCOT)

Ron Ambrosio, Chief Scientist, Utopus Insights, Inc.

Tanya Barham, Principal, Community Energy Labs

Ron Bernstein, President, RBCG, LLC

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

Doug Houseman, Grid Modernization Lead, Burns & McDonnell

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

James Mater, Co-Founder and Director, QualityLogic, Inc.

Farrrokh Rahimi, Senior Vice President, Open Access Technology International, Inc.

Leonard Tillman, Partner, Balch & Bingham, LLP

GWAC Members not present

Joe Hagerman, Deputy Chief Scientist, NRECA

Stephen Knapp, Vice President of Quality Assurance & Energy Markets, Power Analytics Corporation

GWAC Associates & Emeritus

Kay Aikin, CEO, Introspective Systems

Rahul Bahadur, VMware

Mark Knight, Burns & McDonnell

Aaron Snyder, EnerNex

Ken Wacks, Home, Building & Utility Systems

GWAC Guests

Dave LeVee

Robert Burke

David Katz

Stuart McCafferty

David Wollman, NIST

Larisa Dobriansky, General Microgrids

David Wollman, NIST

PNNL Support

Ron Melton, GWAC Administrator

Susan McGuire, GWAC Coordinator

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Administrative

A quorum has been reached David opened the meeting at 10:01 am.

David Forifa asked for a motion to approve the August minutes. Doug Houseman gave the motion, Ron Ambrosio seconded the motion. Gerald Gray abstained since he was not on the last call. The vote was otherwise unanimous with no objections.

Review Meeting Minutes & Actions

- August 21, 2019 – meeting minutes approval

- Action items from previous meetings
  - ➤ **All**: please let Ron know if you will be unable to attend a call ahead of time.
  - ✓ Draft Agenda for November F2F Meeting – Melton
  - ✓ Explore location for November F2F Meeting – Melton
  - ✓ Set date for November F2F Meeting – Melton
  - ✓ Pull TESC 2019 Call for Abstracts from GWAC Web Site - McGuire
  - ✓ Circulate the Economic Resilience White Paper to the Council - Melton

  - ➤ Action: Ron Bernstein and Ron Cunningham to discuss the production of Grid 3.0 future white papers and Ron Bernstein to note them on the GWAC Activities Matrix. (On Hold for Now)

Ron Melton noted that all action items are completed except the last one.

He noted that Chris Villarreal will not be able to join us today

Conferences and Events

(**Bold** indicates GWAC speakers)

- NARUC Annual Meeting, San Antonio, TX, November 17 – 20, 2019
- AHR Expo, Orlando, FL, February 3 – 5, 2020
- NARUC Winter Policy Summit, Washington, DC, February 9 - 12, 2020
- IEEE ISGT 2020, Washington, DC, February 17 – 20, 2020
- IEEE PES General Meeting 2020, Montreal, August 2 – 6, 2020

- GWAC Face-to-Face Meeting?
  - When – Nov. 5 – 6, 2019
  - Where – to be discussed today
  - Workshop topic – Grid Future States Refresh and Deep Dive on High DER, DA & Storage Reference Architecture

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Regarding the AHR Expo, this year Ron Bernstein may not be able to lead the GWAC panel.

Nov. 5 and 6 are the current proposed dates for the GWAC Fall F2F.

Gerald Gray noted that next week is Plug Fest in Charlotte, North Carolina.

Ron Melton asked who would be able to attend the F2F meeting Nov. 5 and 6. Farrokh will be in Minnesota Nov. 5 and 6. Generally he goes there the first week of every month.

Ron Ambrosio will be in DC that week.

Lorenzo Kristov noted that transmission technologies same date and he has been invited to attend that.

New GWAC associates

GWAC Associate Nominations

Nominations were received and confirmed for the existing GWAC Associates:
- Ron Cunningham
- Jeff Morris
- Mark Paterson
- Chris Villarreal

And new GWAC Associates:
- Kay Aikin
- Rahul Bahadur
- Aaron Snyder

Mark Knight will be an emeritus status GWAC member.

The GWAC bylaws call for a 25% refresh on any GWAC member cycle. For the next round 4 to 5 members will be needed. Ron Melton asked if Dave Wollman will serve on the selection committee and he agreed to be the outside party on the committee. Ron will talk with Chris Irwin (DOE) about it this Friday. Two council members would normally serve on the committee, but all are due for renewal since we missed one cycle. One option would be to defer to just Dave Wollman, Ron Melton and Chris Irwin (all non-council members).

Ron Melton will talk with the Council members individually to see if anyone is planning to transition off.

Tanya Barham expressed interest in serving on the committee.

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David Forfia said if there are members not wanting to continue, they could serve on the committee or we could use two Emeritus members to serve. This idea was supported by several GWAC members.

David Forfia asked for a motion, Doug Houseman offered a motion saying he would prefer to use emeritus members and Bernstein seconded the motion. David heard no objections; the move was approved unanimously.

Action: Two Emeritus members could serve on the new member committee.

Ron Melton will update the call for new members on the website next week. It will be sent out to the friends of GWAC list.

Action: Ron Melton will update the call for new members for 2020. Susie will send the announcement out to the GWAC lists.

A reminder that employer approval will be needed for nominees was given by Ron Melton.

Ron Melton also noted that Trevor Gionet has withdrawn his nomination because he has left his employment and started his own company.

GWAC New Member Call

⊙ GWAC Call for New Members

- Working on this now
- We skipped a cycle – will do a combined refresh
- Need to have 4 to 5 new members
- Updating the call – will reissue late this week or early next week.
- If we get sufficient response, want to complete by Nov. F2F meeting
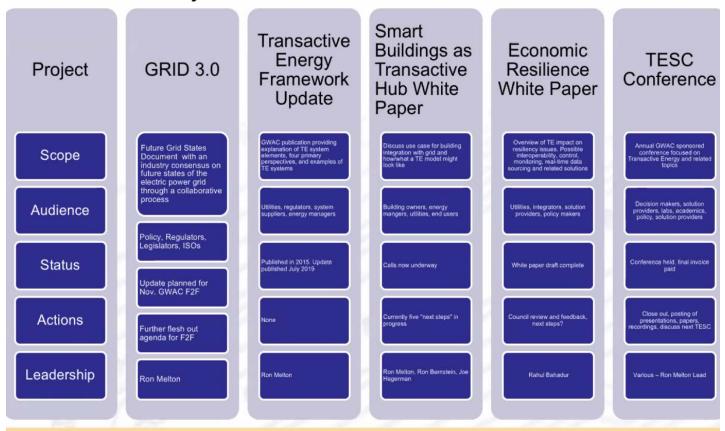- Plan to randomly assign 1- or 2-year terms due to delaying the refresh

Lorenzo Kristov would like the council to look at how to get more women on the GWAC council.

Ron Melton said if the GWAC members could help to recruit. Some names were put forth and discussed.

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⊙ GWAC Projects

Project	GRID 3.0	Transactive Energy Framework Update	Smart Buildings as Transactive Hub White Paper	Economic Resilience White Paper	TESC Conference
Scope	Future Grid States Document with an industry consensus on future states of the electric power grid through a collaborative process	GWAC publication providing explanation of TE system elements, four primary perspectives, and examples of TE systems	Discuss use case for building integration with grid and how/what a TE model might look like	Overview of TE impact on resiliency issues. Possible interoperability, control, monitoring, real-time data sourcing and related solutions	Annual GWAC sponsored conference focused on Transactive Energy and related topics
Audience	Policy, Regulators, Legislators, ISOs	Utilities, regulators, system suppliers, energy managers	Building owners, energy mangers, utilities, end users	Utilities, integrators, solution providers, policy makers	Decision makers, solution providers, labs, academics, policy, solution providers
Status	Update planned for Nov. GWAC F2F	Published in 2015. Update published July 2019	Calls now underway	White paper draft complete	Conference held, final invoice paid
Actions	Further flesh out agenda for F2F	None	Currently five "next steps" in progress	Council review and feedback, next steps?	Close out, posting of presentations, papers, recordings, discuss next TESC
Leadership	Ron Melton	Ron Melton	Ron Melton, Ron Bernstein, Joe Hagerman	Rahul Bahadur	Various – Ron Melton Lead

The GWAC matrix was discussed. The TE Framework is complete and can come off the list.

The two white papers are in progress.

TESC future meetings will be discussed later today.

Ron Bernstein would like to also show past accomplishments on this matrix such as a history slide. The goal would be to show others what GWAC has accomplished.

Gerald Gray said that this matrix is beneficial to him for talks in which he mentions the GWAC.

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For continued discussion today - TESC
- TESC 2019 Closeout
- TESC Future Planning
  - Timeframe?
  - IEEE as partner?
  - Other aspects?
- Initial discussion within IEEE PES Smart Buildings, Loads and Customer Systems about being the future conference organizer.
  - Thoughts and reactions?

Tanya Barham noted that she has not been able to find the TESC19 papers on the Explore resource center.

Ron Melton said the four TESC19 papers will be in IEEE Explore but not the presentations and he noted that a code would be sent out to conference attendees so that they can download materials without cost for a period. Farrokh Rahimi said that the TESC19 IEEE Explore site may not be ready yet. He said our part has been done but it typically takes time for things to be posted. He will check on them.

Ron Bernstein noted that the TESC19 financials are being finalized. The last check has been issued and once it is cashed the bank account can be closed and that the conference surplus was about 15K. He also noted that his company will not be hosting TESC19 content on his web site, that was nixed. Everything will be on the IEEE site. People should be able to find things by session. Ron also told the group that he has a lot of photos from the conference and he will create a folder on the conference Sharepoint (GridArch.org) site for future reference.

Ron Bernstein provided a link to the IEEE Resource Center for TESC19 transcripts:
https://resourcecenter.ieee-pes.org/common/content-list.tag.html/tesc

Future TESC conferences

Ron Melton proposed next date or the TESC would be Nov, Dec 2020 if GWAC chooses to have another conference. He noted that the smart building group of the IEEE would be the future organizing committee if we did a full hand off to them.

Doug Houseman said that the IEEE intelligent Grid and Emerging Technology (IGET) would be interested

David Forfia asked if this happens what would GWACs future role be with this conference.
Ron Melton thought that the GWAC would help with the first transition and then would step back as an organization. Individual members could remain involved.

Farrokh Rahimi said that for 2020 having some GWAC members on the organizing committee again would be needed for a successful conference.

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Ron Melton noted that with the transition to an IEEE conference, Mark Knight had structured the organizing committee to be like what IEEE does typically.

Ron Bernstein noted that he would like to see the GWAC members continue to contribute to content but not to structural positions.

Doug said that IEEE has rules about the technical program regarding what technical co-sponsors are required to do and how much they can control they can give. He said IEEE would probably look for TE experts to be the tapped.

Ron Melton said that if IEEE takes over the meeting it would be so that GWAC could move on to other activities.

Ron Bernstein said that IEEE did make money on this year's conference so they should be happy to continue.

Ron Melton noted that he is hearing consensus to move ahead with an IEEE continuation. The next time and place will be explored.

Doug asked if it will then remain an IEEE Conference. Ron Melton said it might be folded into ISGT, an IEEE PES conference. Doug said Pat Ryan with IEEE would like to create 8 or more new PES meetings, some of which would be in Asia or Europe as well as regional versions for the U.S.

Ron Melton and Doug Houseman will talk a bit more about this offline.

Action: Ron Melton to schedule a meeting with Doug Houseman to further discuss IEEE and TESC

Gerald Gray added that other technical communities might want to promote TE topics like CIM and Open FMB. Ron Melton added grid architecture to that list.

Gerald also noted that EV charging could be a new area with sub groups on architecture diagrams that are reusable and have detailed frameworks. Ron Melton noted that we would need to be careful not to duplicate SEPA work groups.

James Mater suggested EV charging architecture be added.

Ron Ambrosio suggested hybrid wind farms and on to behind the meter storage – a wide topic area.

Tanya added flexibility such as with storage to the list and how to use assets in new ways. This could overlap Transactive Energy. She feels that storage and EV charging would be good topics. She further suggested that we could explore how to connect the market for flexibility with things like storage and assets that could be scheduled and deployed in different ways.

Ron Ambrosio agreed with Tanya and added that Storage allows us to create flexibility.

David suggested talking more about this off line.

Larissa said there are interesting regulatory topics that maybe relevant.

GWAC White Papers

Smart Buildings as Transactive Hubs Update – Ron Bernstein
- Third meeting took place on Sept. 3rd
  – Ron M, Ron B, Doug, Leonard, Mark, Farrokh
- Farrokh has created use case categories
- Pulling material from TE tutorial material
- Target is a narrative document - ~5 pages
- Next meeting is tomorrow (Sept. 19th) at 2:00PM PT

Ron Bernstein noted that the Smart Buildings white paper group is working on an outline and use cases. There will be a work meeting tomorrow. The paper is coming together. Additional Active participants are welcome to join the effort. He will add Tanya Barham to the invites. They are hoping to have a publishable paper within the Jan timeframe. This paper is meant to be an overview.

David Katz noted that CABA is interested in participating on this white paper. Ron Bernstein will send him a hard copy.

Rahul Bahadur expressed appreciation for his GWAC Associate nomination.

Rahul noted that the Economic Resilience white paper was presented at TESC19. The paper has been sent out for review. He encouraged everyone who received a copy to look it over and provide feedback

Farrokh Rahimi asked if it would be published as a GWAC paper? Ron Melton replied that the white paper will be published as a GWAC document, but individuals could submit papers to technical groups.

Dave LeVee will coordinate with Rahul on that since he was originally on the paper committee.

Ron Melton said all GWAC members can provide comments to Rahul at this time.

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Interoperability Decision Maker's Checklist

Interoperability Decision Maker's Checklist – update?
- Feedback at NARUC meeting last week suggested that an update would be useful
- Discussion?

David Forfia asked if it is worth the effort to do a refresh of Interoperability document? He has heard comments that it is out of date.

David Wollman told the group that NIST appreciated help received from the GWAC on the NIST/NARUC effort at Interoperability for technocrats and not just bureaucrats. Regulators feel they need more help to prepare for rule making and to understand what utilities are providing to them. The GWAC stack and framework were referenced. They need more basic help like with the interoperability checklist.

David Forfia felt that the GWAC members and emeritus and friends presentation helped. Steve Widergren, Jeff Taft and Paul DeMartini were there and provided information about interoperability.

Ron Melton noted that a separate call to discuss this more is needed.

Action: Ron Melton to schedule a call with David Forfia and David Wollman to discuss what is needed regarding the Interoperability checklist.

GWAC Fall Face to Face Meeting

Ron Melton reviewed a general outline of the next GWAC Face to face meeting. He asked Dave Wollman if the Framework 4 will be out in November. Dave replied that is the expected timeframe and if not, a draft would be available.

Some breakouts on it would be added to the agenda such as High DER, DA and storage and an architecture discussion.

Day 2 would continue the deep dive with discussions.

Ron Bernstein said we need to be mindful of spending too much time on technical details. We want actionable results.

Regarding the meeting venue, Ron Bernstein said that he could host 40~ people at his home in San Diego. It is within an hour of the airport.

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Kay Aikin noted that she could attend in San Diego Nov. 5, 6 because she will be at the North American Storage Conference.

Ron Bernstein said that he is neutral as to whatever the committee wants to do. The location is peaceful but not near other venues.

Gerald Gray said it sounds good to him if there is coffee.

Ron Melton noted that Nov. 5 and 6 may not work for several people so other dates were proposed and discussed.

Liaison Reports

ISO/IEC - Ken Wacks told the group that the GWAC TE Roadmap has been approved; the vote was 12 for and 1 against. The document will be published by ISO, IEC, ANSI, and other national standards bodies. Germany voted no, saying that there were no technical specifics and then suggesting that it is an information report on intended US national policy.

The document has been reviewed by the IEC to comply with their format requirements. Suggested edits have been submitted by the IEC via Ken to Ron Melton and Susie McGuire. Ken will be chairing the semi-annual ISO/IEC meeting next week in Nagasaki, Japan to continue developing IoT standards for homes and buildings including energy management applications.

Ron Melton asked if we should also ask the IEC to publish the TE Framework? Ken said he can pull it from the GWAC website and ask about it at the meeting in Japan.

SEPA – David Forfia said that planning for the Grid Evolution Summit 2020 is underway. The next meeting will be in quarter 1 of 2020.

EPRI - Gerald Gray reminded everyone that Plugfest next week in Charlotte, North Carolina.

ASHRAE - Ron Bernstein – a new standard was approved and will go to ANSI. Building controls communication over high speed carrier over power lines. It is a new technology.

IEEE PES – Doug Houseman noted there are no updates at this time.

David Forfia asked for a motion to adjourn. Ron Bernstein gave the motion and Farrokh Rahimi seconded the motion.

Standards for IoT Interoperability, Cybersecurity, and Energy Management

Nagasaki, Japan – September 27, 2019

Consumer electronics and IT experts from Asia, Australia, Europe, and North America gathered this week in Nagasaki, Japan to continue work on a family of international standards called the *Home Electronic System* (HES) for IoT (Internet of Things) in homes and buildings. These standards are essential for accelerating market growth by offering manufacturers an infrastructure for creating unique and exciting products to enhance living and working in homes and buildings.

The focus this week was on developing standards for:

- Interoperability to create integrated systems from diverse products

- Cybersecurity to protect customer privacy, data, and safety

- Energy management for apartment complexes

- Energy allocation based on artificial intelligence (AI)

Development continued on a systems-architecture and communications-protocol to facilitate applications to work together seamlessly. A practical demonstration of our standards was mounted to show competing room air conditioners that could be operated from any manufacturer's app using HES standards (based on ECHONET).

We are developing a series of standards for a common user interface (or smart phone app) that controls any home application such as lighting, window shades, and entertainment equipment. These standards specify a framework for interoperability and a common language to interconnect applications via service modules in the HES gateway. The HES gateway also includes service modules responsible for cybersecurity protection of customer data, privacy, and safety. Using these modules the gateway provides "sentry" functions to ensure that:

- Only authorized devices connect to the home or building network.

- All data communications to the outside are with authorized servers.

- The occupant manages privacy by authorizing all data transmission.

- Data received do not cause unsafe appliance operation.

Energy management is most effective when tailored to a specific home or building. This committee previously issued a standard framework for the Energy Management Agent (EMA), which allocates energy to appliances based on:

- The cost of power from the electric company

- Available local sources of power such as solar, wind, and storage

- Appliance power requirements

- Customer's schedule for appliance operation
- Customer's budget

The EMA is being extended from single houses to apartment buildings and a campus of apartment buildings (an "apartment complex") to optimize energy consumption per apartment, per building, and across the complex. This will require many standards to specify how EMAs interact and communicate. These include standards for AI (artificial intelligence) to be incorporated into each EMA for optimizing energy conservation according to goals set by the apartment occupant and complex manager.

By developing products based on a standard infrastructure, manufacturers can focus their expertise on applications that deliver novel customer experiences through innovative products. Consumer benefits because they can mix products and services from various manufacturers in order to create a personalized environment where everything works together. Lighting, entertainment equipment, heating and cooling, health and safety systems, solar power, electric vehicles, and appliances can be coordinated to deliver services automatically like an electronic butler.

About HES

An ISO/IEC[1] committee of worldwide experts is developing a family of more than 60 standards for IoT and applications in homes and small buildings. These standards are intended to stimulate international commerce by guiding designers, manufacturers, and installers of products and related services for the home and building system markets.

Contact

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[1] The *Home Electronic System* (HES)   is the name of the international standards committee officially designated as ISO/IEC JTC 1/SC 25/WG 1:

      ISO = International Organization for Standardization
      IEC = International Electrotechnical Commission
      JTC 1 = Joint Technical Committee 1, entitled *Information Technology*
      SC 25 = Subcommittee 25, entitled *Interconnection of Information Technology Equipment*
      WG 1 = Working Group 1, entitled *Home Electronic System*

The missions of the ISO and IEC are to foster international trade and commerce.