

Meeting Minutes

May 22, 2024

GWAC Members

Ron Ambrosio, Independent Energy Transformation Professional, Acting Chair

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

Andrew Bordine, Sr. Practice Manager, Grid Automation, Actalent

Marc Costa, Dir. Policy Planning, the Energy Coalition

David Forfia, Principal Consultant, Utilicast

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

Ahlmahz Negash, Sr. Power Analyst, Tacoma Power

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

Aaron Snyder, Dir. of Grid Technology Consulting, EnerNex

Leonard Tillman, Partner, Balch & Bingham, LLP

GWAC Associates & Emeritus

Ron Cunningham, Emeritus

Jeff Morris, Associate

Ken Wacks, Emeritus

GWAC Guest Speaker

Philip Court, Ecosuite, Guest Speaker

GWAC Friends

Larisa Dobriansky

Anthony James

Dave LeVee

James Orenstein

Jeremy Roberts, Green Button

Hayden Reeve, PNNL

Harry Peterson

Stephan MacDonald

Artis Riepnieks, PNNL

Tylor Slay, PNNL

Tim Schoechle

David Wollman, NIST

PNNL Support

Jaime Kolln, PNNL GWAC Administrator

Susie McGuire, GWAC Coordinator

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Chair Ron Bernstein opened the meeting with Quorum.

Jaime Kolln explained that the meeting recording would be used to clarify meeting notes and to pull speaker videos for posting on the GWAC website. He added that guest speakers will be asked if they are willing to share their presentation videos on the website.

Philip Court with Ecosuite will be today's GWAC speaker. He confirmed to Jaime Kolln that today's presentation can be posted on the GWAC website.



Agenda

Call to Order and Roll Call

- Welcome

GWAC Administrative Business

- Minutes
- Upcoming events
- GWAC Accomplishments
- Action Items

Guest Speaker – Philip Court, Ecogy Energy

Future Activities

- Planning 2024 GWAC Conference
- GWAC Strategic Outreach Plan

Work Product Status Reports

- GWAC Projects Overview Chart review
- Working Party Status Updates *(Lorenzo was planning to present an update on his slide – he will be virtual now)*
 - Grid Architecture White Paper
 - Grid Future State White Paper
 - Grid Arch for Regulators White Paper
 - Applying Grid Architecture Concepts to Bridge Back from the Future Grid
 - Grid Architecture Concept Model for Interconnection, Electrification, and Decarbonization
- Liaison Reports

New Business

Review and Approve Meeting Minutes

- **All:** please let Susie McGuire know if you will be unable to attend a call ahead of time.
- The minutes for April 2024 have been sent out for review

David Forfia gave a motion to approve the minutes, Ron Ambrosio seconded the minutes. There were no objections. The minutes were approved.

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Jaime Kolln thanked Farrokh Rahimi and his company, OATI, for hosting the GWAC meeting last month. Jaime noted how impressed he was with thermal, mechanical, and electrical systems in the microgrid as well as the overall operation of OATI. He asked Farrokh to thank all the staff who contributed to a successful meeting and microgrid tour.

Ron Bernstein said that he has captured speaker videos from the meeting at OATI. They should be ready for posting on the website soon.

Jaime noted that Chris Irwin is not on the GWAC call today but is looking forward to Chris’s talk from the OATI F2F being posted on the website. He said the talk highlighted four key topic areas that will have influence on planning the GWAC Symposium agenda. Jaime added that the Symposium planning is underway.

Conferences and Events

Date	Event	Location	Attend	Speaker	Topic
Apr. 30 – May 2, 2024	V2G 2024	San Diego, CA	James Mater, Jaime Kolln		
May 6 – 9, 2024	IEEE PES T&D Conference & Expo	Anaheim Convention Center	Jaime Kolln, Kay Aikin		Accelerate the Grid of Tomorrow
May 14 – 16, 2024	Energy Storage Safety and Reliability Forum (ESSRF)	PNNL Campus	Jaime Kolln		
May 22 – 24, 2024	ARPA-E Energy Innovation Summit	Dallas, TX	Sec. Granholm		
June 22-26, 2024	ASHRAE Annual Conference	Indianapolis	Ron Bernstein		
July 21 – 25, 2024	IEEE PES General Meeting	Seattle, WA	Jaime Kolln, Farrokh Rahimi, Ron Melton, Ahlmahz Negash		
August 4 - 9, 2024	ACEEE 2024 Summer Study	Pacific Grove, CA	Marc Costa		Energy Efficiency in Buildings
Sept 9 - 12, 2024	RE+ Anaheim, CA & GWAC Symposium	Anaheim, CA	GWAC		
Oct. 1 – 2, 2024	Grid FWD 2024	Banff, Canada	Jaime Kolln, Ahlmahz Negash		
Oct 15-16, 2024	Design Lights Consortium Summit	Milwaukee, WI	Ron Bernstein		
Jan. 21 – 23, 2025	IEEE PES Grid Edge Tech	San Diego, CA	Kay Aikin, Jaime Kolln		

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Jaime reviewed recent conferences attended by GWAC members. He said that the V2G Forum 2024 was very engaging. The panels were managed by utilities and in line with that there was a lot of discussion on policy. There was a lot of discussion about DSO legislation underway at this time in Maine. It’s very relevant to transactive energy work that the council has done. As we start enabling distribution level markets potentially the structure of their DSO is still being determined.

Kay Aikin, who is from Maine, added that it’s a study to determine if a DSO is financially and operationally feasible. It’s not to implement a DSO, it’s to determine whether a DSO makes sense. So,

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it's a long way from anything even close to being operational. Kay helped the legislator who wrote it to modify it. Kay added that Lorenzo Kristov is on the study committee and so Mark Paterson.

Jaime said he is excited about it and is watching it.

Hayden Reeve added that his read on the legislation is that if the study was affirmative on feasibility, they were basically looking to move forward with it in implementation.

Kay replied that depending on what Strategen's conclusions are, it's a very open question at this time. Kay is open to presenting on this topic at a later date along with Lorenzo and Mark.

Jaime noted that the Energy Storage Safety and Reliability Forum held last week at PNNL was a sold-out event with about 210 people. He said that the keynote was very good and there were interesting discussions including some on sodium ion and other technologies. Jaime said if anyone is interested, he has slides from the meeting and can share them.

Ron Bernstein mentioned an opportunity for GWAC to partner with a Design Lights Consortium Summit next year. They have some interest in integration and related conservation measures for the lighting market. He said that GWAC may be able to come up with a two-hour session with GWAC staff. It would be at AHR Expo in Orlando. Jaime noted that AHR 2025 will not be in conflict with DistribuTECH next year.

David Forfia checked the dates for DTech online:

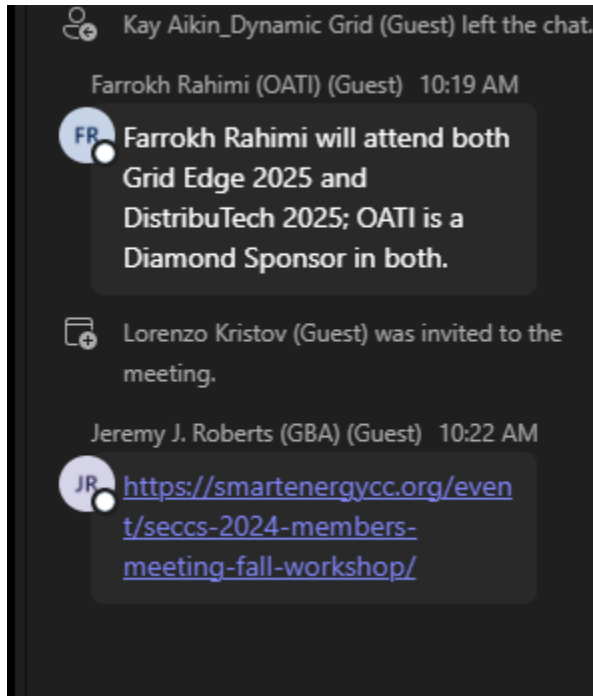
DISTRIBUTECH[®]
— INTERNATIONAL —

MARCH 24-27, 2025 | DALLAS, TEXAS | KAY BAILEY HUTCHISON CONVENTION CENTER

Ken Wacks said the Smart Energy Summit will be co-located with DistribuTECH and it overlaps DTech on the first two days.

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Jaime noted that the Grid Architecture white paper that Seemita Pal led is now published at OSTI.gov and is publicly available. Full title is: **A Practical Introduction to Common Grid Architecture Techniques.** <https://www.osti.gov/servlets/purl/2342144>

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Action Items

- Send speaker ideas to Jaime Kolln and Ron Bernstein and copy Susie McGuire.
- Website updates
 - Continue to add video presentations including speakers to GWAC database bureau post on the website.
 - Create a catalog of speaker materials with links.
 - Feedback requested on format and errors
 - Update Mission/Vision and About the Council Page
 - LinkedIn post highlighting Mission/Vision Update
 - LinkedIn Post highlighting new whitepaper
 - Add an "About the Council" slide to template
 - Make slide deck templates available to GWAC members.
 - Action: Ron B and Jaime to discuss the Mission and Vision with the About the Council video in mind to decide if changes are needed to the video. They will discuss in their regular meeting.
 - Action: Jaime Kolln to send the Future States Vision paper to PNNL editors
 - Action: for GA Concept Model for Transportation Electrification, Jaime and Ron C. to meet one on one to put together some ideas about an outline and materials to pull from.

Jaime said the refreshed GWAC mission and vision will be posted soon, he is having PNNL communications staff review it.

Jaime noted that the Grid Architecture paper that Seemita led will also be posted on the GWAC website soon.

About the Council should be updated after the Mission and Vision. Jaime noted that he will work with a PNNL communications person on the About the GWAC video.

Regarding the GWAC slide deck template (the one used in this meeting) if you need this template, please let Jaime and Susie know.

Regarding the Future States Vision white paper – Jaime has sent it to the editor, and he will work with Ron Cunningham for final steps. Ron C. and Jaime are working on a slide deck for the paper.

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Farrokh Rahimi (OATI) (Guest) 10:19 AM

FR Farrokh Rahimi will attend both Grid Edge 2025 and DistribuTech 2025; OATI is a Diamond Sponsor in both.

 Architecture Council

Guest Speaker

Philip Court, EcoSuite



<https://ecosuite.io/>

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Distributed Energy Accelerated

Philip Court
Co-founder & CTO, Ecosuite

Today : DER Industry

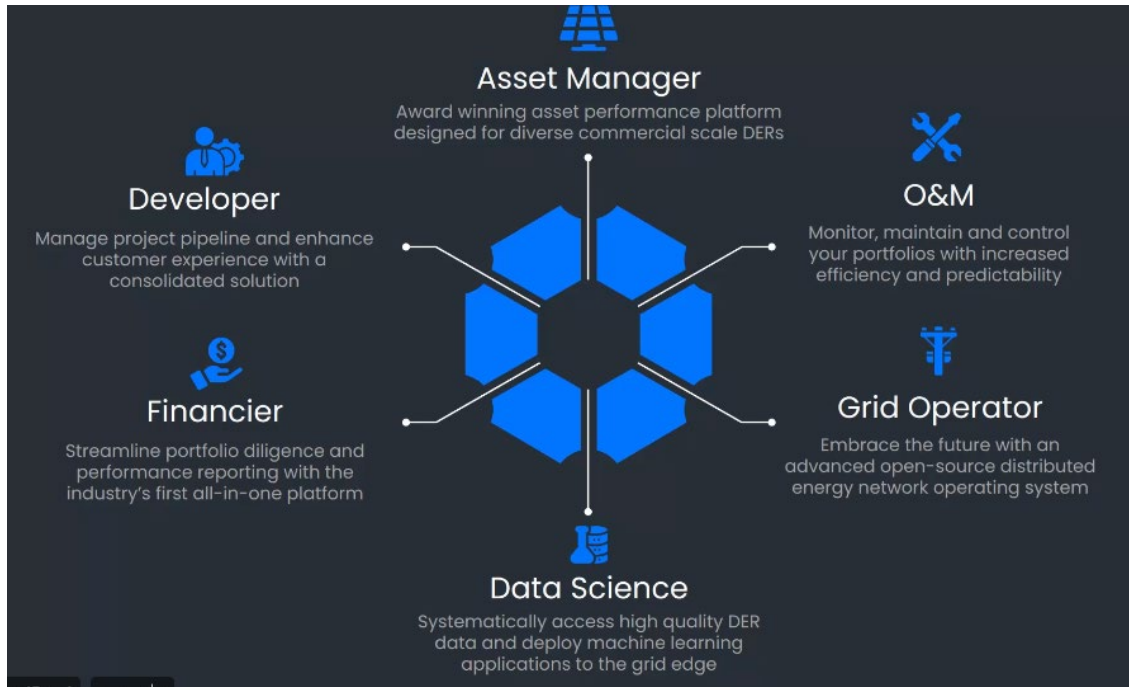
1. Efficiency = Interoperability
2. Interoperability \neq Unlimited hosting capacity (Why?)
3. Need for Policy
4. Transport Layer "Special" - Getting Jiggy with it

Philip Court will focus on the first 3 topics and may get to the 4th.

A slide about DER Industry:

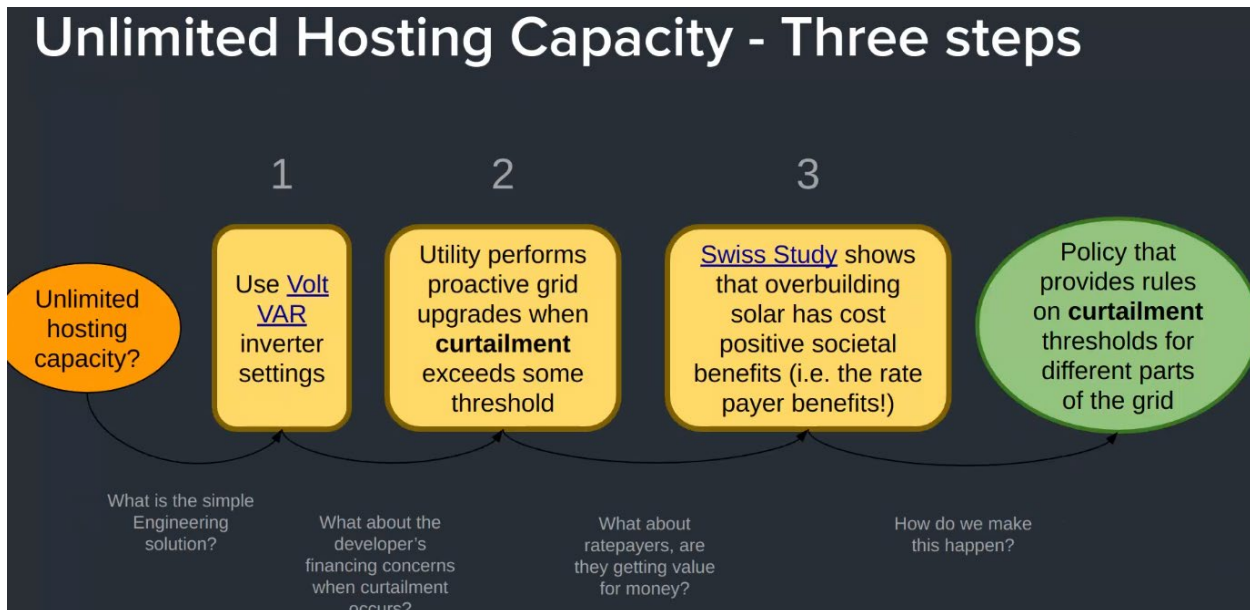
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Consumption, generation, EV storage, buildings,

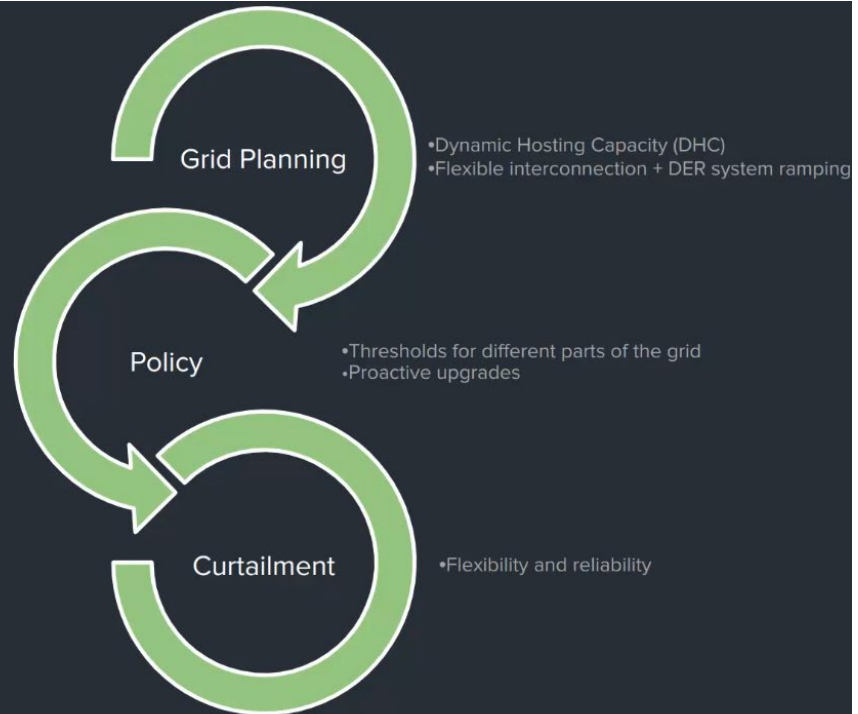
Philip Court gave an example of how flexibility gives reliability (slide just before policy)



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Solution



Lorenzo Kristov asked, “What are rate payer benefits from overbuilding solar?”

Philip replied that the real answer is to go into the Swiss study and reading their report. It comes down to the behavior of solar on grid – the duck curve – it’s the recognition that if you build a solar asset (or even some energy storage) it benefits society on a broad basis to some level you don’t have to operate at 100% to deliver value. If you understand the duck curve – you have the solar peaks. If you curtail it – you are creating an environment where more solar will be built so you are displacing dirtier generation, you are making more renewables available. It’s the balance. If you get the thresholds right, it is beneficial. The different parts of a city or country should have different rules. You don’t want to overbuild in a rural area with just a few houses. In a highly populated with a lot of energy consumers that you know, such as an area with energy poverty or other issues, overbuilding solar and then curtailing it at certain times makes sense.

Kay Aikin added that ten years ago DC to AC inverter ratios were 1 to 1 but now they are approaching 1 to 5 and that’s because developers realize they can clip the top of the curve and get more money out of asset.

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Stephan and Philip discussed TE and solar a bit more and agreed to meet offline.

RESI

Redundant Energy Services Interface (built with NKN-ESI)

Philip mentioned RESI which is a distributed ledger technology based on KN. It's effectively a networking technology that gives you point to point comms without a centralized infrastructure.

Philip mentioned the rules of physics. He gave a link to the Swiss study:

https://www.researchgate.net/publication/361208262_Firm_PV_Power_generation_for_Switzerland

GWAC Symposium

More hotels for RE+ will be opening in the coming weeks. Those planning to attend should keep checking the website.

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Planning the GWAC Conference

- Co-Located at RE+ in Anaheim, CA September 9-12, 2024
 - Specific Format planning on plenaries and two tracks
 - RE+ Technical Session is Monday and Tuesday.
 - GWAC Technical Session will be Wednesday and Thursday
- Schedule Organizing Committee (OC) Meeting
 - Coordinating with Lesley Fondren and Lori Smith (RE+)
 - Discuss regular meeting schedule
- Council Members Participating in the Organizing Committee
 - At Least 4 Council Members
 - No papers this year
 - Need to understand associated fees. Will be tiered based on SEPA/SEIA membership.
- Invited speakers need to be identified
 - Include a timeline of due dates for presenters.
- Discuss Logo
- LinkedIn – We are the council!

Jaime will schedule organizing meetings at 8:00am on Thursdays, Pacific Time. There will be a call every week. There will not be a meeting on June 6.

Jaime mentioned that one of the panels is an international panel and Mark Paterson has offered to lead that panel for the Symposium.

Jaime and Ron B. noted the importance of confirming speakers in advance as well as some back up speakers as a precaution.

Ron B. presented some ideas for the GWAC Symposium logo that was discussed at a recent planning meeting.

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Ron A. commented that the symposium logo should incorporate the GWAC standard logo.

We are the Council!

Jaime reviewed Aaron Snyder's template for "We are the Council" example.

Aaron proposed a "we are the council" template to help GWAC participants to become more familiar with the individual council members. Posts would use a standard template. Adding in some humor would be a great help.

Jaime clarified for Ron A. that the templates are for GWAC in general, not necessarily to promote the symposium.

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Ron B. and Jaime K. will be the first to post their template in LinkedIn. Everyone will use the same template and have the same core components.

Aaron suggested that the posts go up about one person per week. The end of the post can point to "please join us at the GWAC Symposium at RE+."

Action: GWAC leads to complete their "We are the Council" templates and post in LinkedIn and then encourage the remaining Council members to post weekly.



GWAC Strategic Outreach Plan

- GWAC Mission and Vision Statements

Vision

The GridWise® Architecture Council supports a vision of a decarbonized, decentralized, and democratized electricity system to ensure the energy needs of today and that of future generations.

Mission

The GridWise® Architecture Council (GWAC) was formed in 2004 by the U.S. Department of Energy to propose principles for and accelerate the development and adoption of interoperability concepts and standards across all applications operating and interfacing with electric systems.

The Council's mission is to engage with stakeholders to accelerate the development and application of grid architecture concepts and principles. This leads to:

- Identification of critical paths to facilitate the effective evolution of the systems, devices, and entities that encompass the electric systems and achieve societal objectives.
- Advancement of standards, applications, and systems interfacing with the current and future electric systems to ensure they are sustainable, reliable, resilient, efficient, extensible, and equitable.

- Guest speaker recordings continue to be developed and published to YouTube
- Outreach through conference presentations
- Other organizations to "cross-pollinate" ideas with.
 - Identify liaison volunteers, e.g. INCOSE

Jaime asked anyone presenting elsewhere to mention their relationship with the GWAC and give a brief introduction to the GWAC to increase awareness about the Council and its impact on the grid industry.

Jaime said that he would like the Council to consider having Artis Riepnieks, PNNL be a GWAC liaison for INCOSE, the International Council on Systems Engineering.

Jaime if there could be other liaisons to be added.

Ron B. mentioned the Design Lights Consortium also from ASHRAE on grid interactive buildings. He will try to get us more on that soon. It is lighting integration for energy and operational efficiency. Some incentive programs are involved. It's lighting integration for energy and operational efficiency and a lot of their focus now is expanding out of lighting systems into other systems and the monitoring and energy efficiency programs, a lot of it has to do with incentive programs and expanding incentive programs to think beyond just replace your fluorescence and incandescent lights with LED's.

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Ron B. also mentioned having someone from ASHRAE's Grid Interactive Buildings Committee be a GWAC Liaison.



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

- Originally presented at AHR Expo
- Ron Ambrosio and Rahul Bahadur are leading a committee to develop a webinar on "The Next Big Thing"
 - Rahul Bahadur and Ron Ambrosio Updates
- Next Steps
 - Development of a concise slide deck
 - Draft presentation will be reviewed by GWAC
 - Web Page with details including GWAC activities



Ron A. hopes to have his group wrapped up in the next few weeks, it shouldn't take much longer.

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Jaime said maybe we can present the slide desk at ASHRAE or DOE and get it out there. Ron A. will add that to the next workgroup discussion.



Grid Architecture for Regulators

- **Team members:** Lorenzo Kristov, Kay Aikin, Larisa Dobriansky, Jeff Morris, Mark Paterson, Farrokh Rahimi, Chris Villarreal, Ron Bernstein
- White paper will be aimed primarily to GWAC community:
 - Document experiences, observations & lessons learned from the use/non-use/value of Grid Architecture in policy & regulation venues
 - Provide a basis for strategies to promote Grid Architecture among policy makers
 - Paper will be a living document, starting with a few initial case studies and adding new case studies as available
- Initial case studies
 - U.S. — FERC Order 2222
 - State — Xcel Minnesota rate case; CPUC High-DER docket
 - Municipal — Portland Maine
 - International — Ontario, Canada
- Tentative target date: Draft for GWAC review by mid-November; ready for posting early 2024.

Jaime noted that Lorenzo Kristov received good feedback on the Regulators paper at the OATI F2F meeting in Minneapolis and will be incorporating some of that information. The paper is well underway.



GWAC Future Work Products Discussion

Applying Grid Architecture Concepts to Bridge Back from the Future Grid

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

- Committee : **Mark Paterson**, Marc Costa, Ron Ambrosio, David Forfia, Kay Aikin, Lorenzo Kristov, Farrokh Rahimi, Aaron Snyder,
- 2:00 PM PT/ 5:00 PM ET Thursday 2 times 1st and 3rd Thursday of the month

Ron B. gave an update on the progress of this work group. They are defining some sections. Some volunteers have taken sections of the paper to finalize the sections.

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GWAC Future Work Products Discussion

Grid Architecture Concept Model for Transportation Electrification

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. This activity will take place in FY24 and be completed FY25.

- 15-20 page whitepaper
- Committee: Ron Cunningham, Farrokh Rahimi, Mark Ortiz, David Forfia, Aaron Snyder, Lorenzo Kristov, Bhaskar Mitra, Paul DeMartini
- 1:00 PM PT/ 4:00 PM ET, 4th Tuesday of the month

Ron Cunningham has been educating Jaime on concept models in offline discussions. There is some content under discussion. They are building on what has been done with SEPA. Jaime will check with Aaron Smallwood about referencing some of their work.

Action: Jaime to talk with Aaron Smallwood about SEPA citations for this paper.

Liaison Reports

Jaime read Dave Wollman's updates for NIST from the chat (Dave was not able to attend today):

Several NIST presentations at 7th annual international IEEE Industrial Cyber-Physical Systems Conference last week (St. Louis) – including one (Kang Lee) on smart grid/sensor interoperability testing, and one (Dave Wollman) industry forum keynote on CPS and IoT initiatives at NIST (including some smart grid pre-history!).

NIST helped to organize and lead the Model-Based Enterprise (MBE) & QIF Summit - 2024 Summit presentations are now available for download from the 2024 NIST MBE & QIF Summit event page <https://www.nist.gov/news-events/news/2024/04/mbe-qif-summit-2024> (if you wanted to survey some manufacturing-focused efforts).

NIST also hosted our Named Data Networking (NDN) Community Meeting 2024 (Future Internet Architecture) – same thing, recordings of the meeting <https://www.nist.gov/news->

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[events/events/ndncomm2024](#) as well as presentation abstracts https://www.nist.gov/system/files/documents/2024/03/05/NDNcomm2024_Abstracts.pdf are available online.

MBE & QIF Summit 2024

The MBE Summit has brought academia, government, and industry experts together for over 10 years to share the challenges, implementation issues, and lessons. Link <https://www.nist.gov/news-events/news/2024/04/mbe-qif-summit-2024>



Liaison Reports

- NIST – David Wollman
- Green Button – Jeremy Roberts (*New*)
- EPRI – Sean Crimmins
- IEEE PES – Farrokh Rahimi
- ASHRAE, CTA, ASHB (formerly CABA) – Ron Bernstein
- ISO/IEC, IREC – Ken Wacks
- SEPA – Aaron Smallwood
- NARUC – Jeff Morris

- *Are there other organizations we should be hearing from?*

Green Button - Jeremy Roberts said he has read the meeting minutes for the April meeting at OATI.

He noted that Chris Irwin had mentioned Green Button at the GWAC meeting at OATI. Jeremy confirmed that there are now 57 electric and natural gas utilities have certified with the download feature and the connect feature.

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Jeremy added that Nova Scotia is almost complete their certifications, and he said that New York is all feeding into one data base. He said other states are interested in that approach and are watching New York.

EPRI Sean Crimmins is not on the call today.

IEEE – Farrokh had to leave early. Jaime noted that he will give a presentation on the Sequim microgrid at IEEE PES GM in Seattle.

Ken Wacks ISO/IEC – Two documents are being prepared for publication. They have gone through all the approvals process. Ken is the author of a revised framework for energy management by consumers. This allows customers to decide whether to source power from a local solar or wind source or from grid storage or from the grid. They can allocate power using their own priorities.

It's all done by the consumer with the aid of an energy management agent. It's quite specialized for each home and building.

They have another one related to this one on how to program the energy agent. They are applying artificial intelligence which is narrowly tailored to meet the needs of an energy management agent.

Both standards are about to go public and will be available through the ISO and IEC.

Still under development is a standard that Ken has been involved with on safe operation of network appliances when remotely controlled. It received national body approval for them to write the text. It is on track for a swift completion.

There is another new standard on smart lock testing for smart locks with remote access and also one on home-based vehicle to grid charging and discharging. Those two are going out for a vote by member nations. New proposals must get majority support.

IREC – CGE committee – Ken Wacks – IREC meets twice a month. Their speaker for the May 31 meeting will be Elizabeth Parks. She is the president and Chief Marketing Officer of Parks & Associates. They are the premier market research firm in building controls and energy management. They survey households with internet access about their use of connected technology. They make the data available and useful for the consumer electronics and home automation industry.

IREC meetings are fee to attend, sign up at the website here: <https://irecusa.org/>

Ron Ambrosio and Jeremy Roberts expressed interest in the new standards.

SEPA - Ron Cunningham – the group met earlier this month with SEPA Research Advisory Council. Ron Ambrosio is a member also. They coordinate with other SEPA working groups. There is work coming out from various working groups that show up in members only or as artifacts that are available to industry. They are looking at some grant money that is available. He added that David Forfia is also a SEPA member.

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Jaime said Seemita Pal leads the SEPA Grid Architecture working group which meets on Friday mornings now. Jaime is a member of that working group.

GWAC will move the August meeting possibly to a Tuesday early in August. We will send out a poll and pick a date the works for most.

The GWAC July 10 meeting is also a little earlier than usual.

Ron Bernstein asked about a Sept. 13, 14 GWAC F2F meeting after the Symposium on the 11 and 12. There would be a meeting on the morning of the 14th which is a Saturday. It would give more time for the meeting and then we could have a fun event on Saturday afternoon.

The fun outing would be from Noon to 4:00 pm. Ron Ambrosio said he could do it. Jaime Kolln could not do it. Kay would be on a late evening flight on Saturday so she could do it. Aaron said he would fly on Sunday so he could do it.

Anthony James said in the chat Lorenzo Kristov had brought up VPP's some time ago. Was there plans for a presentation and discussions on this topic?

Marc Costa mentioned the ACEEE summer study. He will host an informative session on grid interactive buildings. Attendees will include national labs and regulators. It will be Aug. 4 – 9, 2024 in Pacific Grove, CA.

<https://www.aceee.org/2024-summer-study-energy-efficiency-buildings>

Action: Add the ACEEE Summer Study to the conference list. Marc Costa will be presenting at this event.

Chair Ron Bernstein adjourned the meeting at the top of the hour.

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Adjourn

GWAC online June 19, 2024



<https://gridwiseac.org/>