

## Meeting Minutes

June 16, 2021

### GWAC Members

David Forfia, GWAC Chair

Kay Aikin, Introspective Systems

Ron Ambrosio, Independent Energy Transformation Professional

Ron Bernstein, President, RBCG, LLC

Ron Cunningham, American Electric Power

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

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

Stuart McCafferty, President, GridIntellect

Ahlmahz Negash, Sr. Engineer, Tacoma Power

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

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

Leonard Tillman, Partner, Balch & Bingham, LLP

### GWAC Associates & Emeritus

Rahul Bahadur, VMWare, Inc.

Jeff Morris, Schneider Electric

Ken Wacks, Home, Building & Utility Systems

### GWAC Members and Assoc. not present

Andrew Bordine, VP Energy Mkts & Innovation, Anterix

Ahlmahz Negash - absent, excused

Mark Paterson, CSO, Strategen

Mark Knight, Emeritus, excused

### GWAC Guests

Seyed Masoud Mohseni-Bonab

Toquica Cardenas

Toby Considine

Christopher Fleck

Tony Giroti, EBC

Sarmad Hanif, PNNL

David Katz

Seemita Pal, PNNL

Hayden Reeve, PNNL

Tim Schoechle

Aaron Smallwood, SEPA

David Wollman, NIST

Wade Troxell

### PNNL Support

Karen Studarus, PNNL Administrator

Susan McGuire, GWAC Coordinator

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### GWAC Administration

Karen Studarus announced today's Guest Speakers, Sarmad Hanif and Hayden Reeve, PNNL. They will be presenting a talk on their research and upcoming report, "Resilience System Framework using a Transactive Value Model." They are hoping to elicit comments and feedback as the report moves forward toward publication.

David Forfia called the meeting to order at 10:04am.

David asked for a motion to accept the May GWAC meeting minutes; Kay Aikin gave the motion and Ron Cunningham seconded the motion. It was noted that Ken Wacks minor edits to the liaison report were submitted and the changes have been made.

## Agenda

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### Call to Order and Roll Call (10:00 am PT)– David Forfia

#### GWAC Administrative Business

- Welcome to New Attendees
- Minutes and Actions
- Upcoming events

#### Liaison reports (moved earlier for June only)

#### Invited Guest Speakers (11:00 PT)

- Hayden Reeve and Sarmad Hanif, PNNL on "Resilience Service Framework Using Transactive System Value Modeling"

#### Technical and Policy Activities

- TESC 2022 – May
- GWAC Fall Face To Face? October
- GWAC Projects Overview Chart review
- Technical & Policy Activities
  - Electric Industry Visions – Statements of the Future Grid – Cunningham
  - New Starts Progress
  - FAQ Long Version – update of steps needed to publish
  - GWAC publication citation review by Karen and Jaime Kolln
  - New Website

#### Adjourn

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### Conferences and Events

(**Bold** = GWAC speakers, **blue** = complete since last GWAC meeting)

- Smart Energy Summit 2021, Virtual, Apr. 28, Aug. 4, Oct. 27
- Premier Home Automation Conference, May 25 – 26 2021
- IEEE PES General Meeting 2021, July 25-29, 2021, Virtual
- Solar Power International (SPI) Sept. 20-23, 2021, New Orleans, LA (SEPA affiliated)
- NCEP Sept. 13-15, 2021 (National Council on Elec Policy)
- **GWAC F2F – Fall Meeting**
- DistribuTech 2022 – Jan 26 – 28, 2022, Dallas, TX
- ASHRAE Winter Conference, Jan 29 – Feb. 2, 2022, Las Vegas, NV
- AHR Expo, Jan. 31 - Feb. 2, 2022, Las Vegas Convention Center
- IEEE ISGT 2022, Washington, DC, February 21-24, 2022 – format now FACE TO FACE
- IEEE Rural Electric Power Conference REPC, Cleveland OH, May 17 – 20, 2022
- **TESC2022 – May 2022**

The TESC 2022 Organizing Committee meetings will be starting this coming Monday, June 21, from 12:45pm to 1:45pm. Karen is hoping that the GWAC board will all be able to contribute to the meeting.

Ron Melton noted that it is now determined that the IEEE ISGT meeting will be face to face this year. The conference is looking for good panel sessions and papers. The call is out and GWAC participants are encouraged to organize a panel session.

The call for panels and papers is open now but closes soon.

Ron Melton said that the call for papers and panels is active so if the council wants to organize a panel session around a topic, that would be supported.

**Action:** Request to add IEEE T&D is 2022 in April~ In New Orleans (F2F) from Ron Melton to the GWAC calendar. Done

**Action:** David Wollman asked to add the Grid Evolution Summit / SEPA and provided the link July 26 - 28, 2021. Done

Leonard Tillman asked about the location of the Fall 2021 and May 2022 meetings. Karen said there had been thoughts around Portland for the May 2022 meeting. She asked for suggestions on the Fall 2021 meeting.

Farrokh said some companies may object to supporting face to face travel at this time.

Karen noted that DOE has not authorized travel yet but that could change by fall. She asked the others what their companies and organizations are doing.

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Ron Bernstein commented that he is starting to travel again and Kay Aikin said the same. They both expressed optimism that by fall travel would resume.

Rahul said that VMware is very cautious about travel.

Ron Cunningham said they have no word about opening up travel. AES will have some staff returning to the office soon but not the entire company.

Karen suggested that we revisit the issue in July.

**Action:** Discuss the location of TESC 2022 and the Fall meeting at the next GWAC meeting

Gerald Gray commented that EPRI has a fall meeting that will be virtual but their spring meeting 2022 meeting is expected to be face to face. They are mostly still all working remotely.

Jeff Morris - Noted future NARUC meetings in Denver, and Louisville and suggested they be added to the GWAC calendar. <https://www.naruc.org/meetings-and-events/naruc-meetings-and-events/>

**Action:** Add the NARUC policy summit in Denver and the annual meeting in Louisville to the GWAC calendar.

**Action:** Ken Wacks requested to add [IREC](http://irecusa.org) to the Liaison list (irecusa.org)

David Wollman noted some links posted in the chat window. One is on control system security, an article that notes what NIST provides.

<https://www.industrialcybersecuritypulse.com/control-system-cybersecurity-tips-and-tactics-released/>

NIST basic cyber security tips graphic: [https://csrc.nist.gov/CSRC/media/Projects/operational-technology-security/documents/NIST\\_Control\\_Systems\\_Tips\\_and\\_Tactics\\_Infographic.pdf](https://csrc.nist.gov/CSRC/media/Projects/operational-technology-security/documents/NIST_Control_Systems_Tips_and_Tactics_Infographic.pdf)

NIST Cyber Security special publication 800-82 Rev 2, on tools, technologies and standards, open for comments: <https://csrc.nist.gov/publications/detail/sp/800-82/rev-3/draft>

### **Ken - Wacks ISO/IEC JTC 1/SC 25**

Ken chairs an ISO/IEC committee that is developing IoT-related standards for homes and buildings, including applications for energy management. There is a growing market for locally-sited distributed energy resources (DER) including wind, solar, storage. There will be much more responsibility on customers to decide from what sources to get energy, where to allocate the energy, and what the cost will be. Consumer electronics using automation will help customers make these decisions.

The standards committee has decided to specify artificial intelligence (AI) narrowly tailored for energy management. The second major undertaking is to specify a gateway that serves as a sentry for the home or building with cybersecurity protection for device data, customer privacy, and safety. The gateway ensures that devices connected to a home network belong there and are authorized to be used on that home network. Also, the gateway verifies that these devices connect only to authorized servers

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if they depend on services outside the house. Where possible the gateway validates that message. Payloads sent to external servers conform with the contracts that customers have with service providers to ensure that only the requisite data are supplied in order to protect customer privacy.

The next meeting series will be the weeks of September 13 and 20 and will be virtual. Please contact [Ken Wacks](#) if you would like to join this organization and participate in the development of world standards that are intended to promote international trade.

### **Ken Wacks - IREC, the Interstate Renewable Energy Council**

IREC has assumed oversight of the Customer Grid Edge (CGE) committee, formerly hosted by SEPA. It is a very active group; the average number of attendees has grown since moving from SEPA. There is no charge to attend and no membership requirement.

IREC CGE will host a discussion on June 18 about energy economics moderated by Kay Aikin, the CEO of Introspective Systems and GWAC member. Previously CGE had presentations about two different approaches to economics for customer involvement in energy management. One was more price based and the other was more involved in load shaping. The first was offered by Dave LeVee, an economist formerly with Portland General Electric and now the CEO of Pwrcast; the other approach was proposed by Dr. Robert Cruickshank with the Society of Cable Telecommunications Engineers, a subsidiary of CableLabs.

Kay will moderate a faceoff between these two on "Economic Markets and Methods," that could motivate customers to adapt their loads to supply limitations from DER, microgrids, and public grids. Those who attend will be encouraged to ask questions. The next meeting will be June 18, at 1:30pm, EDT. All meetings are open at no charge. The meetings are open, no payment is requested. For more information please see the IREC website link: <https://irecusa.org/blog/>

**Aaron Smallwood -SEPA**, on the program side their Hydrogen Power Conference(H2 power) is in progress. Themes include regulator and stakeholder engagement, benefits to consumers, natural gas, hydrogen. It will be interesting to see summaries of conferences.

The Grid Evolution Summit is July 26 - 28 and is virtual only this year. Themes are utility programs, processes and structures that something accelerate clean energy. They will also talk about Incentivizing carbon reduction, stakeholder engagement, non-wire solutions and more.

Smart Energy Week will be held in New Orleans this September. It includes solar energy international, wind energy international, smart energy marketplace plus microgrid and hydrogen fuel cell international. They are expecting attendance to be on par with the 2019 event held in Salt Lake City which had about 20,000 people.

Working groups highlights; much progress has been made on their EV fleet management charging use case and work continues through the summer. Some of you have participated in our cyber security work group, the group has a new leader, Ahmed Mousa, PSE&G.

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Seemita Pal, PNNL and Venish Salim, NREL will be speakers this summer. Grid Architecture group is doing great work on the Grid Architecture Primer; it highlights utility and regulatory relevance and development efforts.

Grid ontology work continues; examples of standards harmonization, defining the relationships with the GMLC grid architecture effort, good progress is being made.

SEPA catalog of standards - three candidate standards going on for 2021, the evaluation process is going on now. The 3 candidates standards are: IEEE 2030.7 Microgrid controller, 1547.1-2020 and Orange button.

Gerald Gray mentioned that EPRI's Incubatenergy Labs 2021 Cohort Demo Startups have been announced and Community Energy Labs was named as one of those selected.

<https://www.epri.com/about/media-resources/press-release/2rolNsTdfG9aqDC9fU6T0v>

**Ron Bernstein - ASHRAE and CTA** Summer meetings for both groups will take place this month.

Ron B. noted that a new guide specification that will be approved this summer on how buildings connect to cloud services.

He noted that a group is working on Smart grid connectivity for smart buildings. They have produced some guidance on energy management routines, how to take signals, open ADR model, and having individual subsystems respond in specific ways. They are trying to bring methodology into standard language. In Cloud-based apps there is a new standard is making its way through.

IEEE - Farrokh Rahimi said the call for panel proposals for ISGT is due July 30. Link <https://iee- isgt.org/2022-isgt-na-call-for-panels/> GWAC groups may want to submit a panel to ISGT; there is still time.

Farrokh reminded everyone that IEEE Blockchain Standard Activities are now under TES and Ron Melton is the chair for it. There are various teams working on aspects of this.

Ron Melton added that the IEEE Block Chain TE white paper (BCTE) is now drafted for comment. Ron encouraged GWAC participants to provide feedback for it. It is still a work in progress and would benefit from feedback. [BCTE is available at no cost from the IEEE website.](#)

Tony Giroti and Gerald Gray said they would like to provide comments.

Farrokh said there is no deadline on when comments are due back.

Tony Giroti - Energy Blockchain Consortium: EBC presented 2 days ago on Clean Energy Forum Asia. There is a lot of interest in Asia Pac market on blockchain technology. Tony will chair a new group in EUR - Smart Grid Federation. It will start to enable the Pacific Rim countries incl AU and Asia to use BC tech in the energy sector. It is starting to get traction. One output from the group is a white paper that is in development and expected in a couple months. EBC is developing a sustainability platform. It is

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funded by grants. The baseline platform is to create a clean energy economy with a net zero footprint. They have two pilots in Georgia which are going well.

There will be an EBF webinar in July and in Aug. If anyone wants to participate or attend let Tony know.

The EBC annual conference will be held in November. Tony will keep GWAC apprised of the date as it becomes firm.

**Jeff Morris for NARUC**, noted that there are several active stakeholder groups working on papers on microgrid interactions with distribution grid utilities, as well as on grid interactive buildings, solar and cyber security, to name some. These are done in partnership with NASEO. He gave a link to the partner page. The page links to several groups. <https://www.naruc.org/cpi-1/>

Rahul Bahadur put a link in the chat for “Vmware and the National Science Foundation Announce Academic Awards for Public Research in Sustainable Digital Infrastructure.” Academic awards were recently announced, see the link below:

<https://www.vmware.com/company/news/updates/2021/national-science-foundation-sustainable-infrastructure.html>

Farrokh asked about GWAC interest in NAESB (North American Energy Standards Board) work on FERC 2222 regarding distributed energy resources, aggregations, and similar items. He asked if GWAC would be interested in hearing more about NASPI?

Dave Wollman told Farrokh that he attends the meetings and said he said that Jonathan Booe is a good contact with NAESB. He thinks it’s a good idea but defers to the group.

Ron Cunningham said that there has been near term interaction on FERC 2222 efforts - pending implementation starting in 2022. GWAC had previously opted not to do direct feedback but if there are architectural impacts his organization, AES may get involved. He said it’s the argument of immediacy vs long term intent for GWAC.

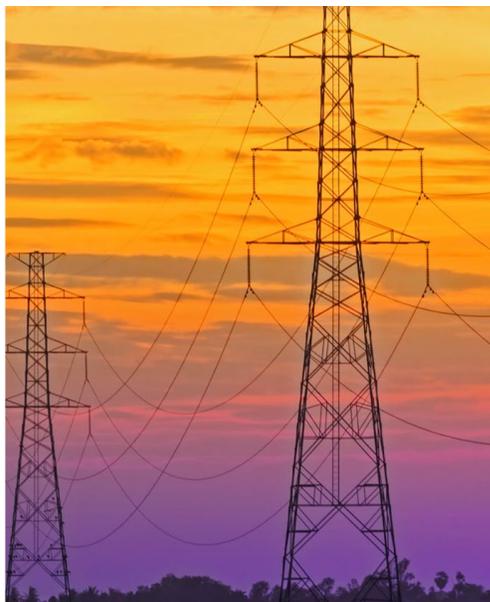
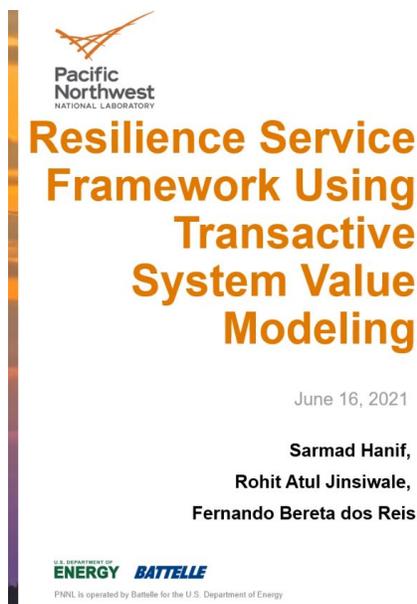
David Forfia suggested that they defer this discussion until later.

Karen introduced today’s Guest Speakers, Hayden Reeve and Sarmad Hanif, both with PNNL who have been working on a parallel activity on resilience service framework using value modeling for resilience framework. Hayden said they will give an introduction today, review exhibits and would appreciate any feedback that GWAC can provide.

Sarmad Hanif also said he encouraged external feedback on the framework from GWAC attendees saying they are hoping to create interest in it today and they would welcome any input from GWAC participants.

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Sarmad gave an overview of the complex problem of dealing with resilience. He reviewed ways to place services and values and capture them in a dual process.

He said that that transactive energy is not the main focus but values will be applied. Resilience is an important parameter in utility planning and operation. He also noted that they have adopted the GWAC definition for resilience.

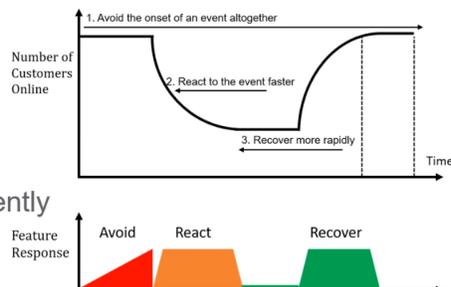


### Resilience Model [2]

- A system is “resilient” to the degree it can

1. Avoid a detrimental event
2. React during an event to lessen its depth
3. Recover after an event has occurred

- Each stage operates “functionally” independently



[2] GWAC, “Reliability and Resilience Considerations for Transactive Energy Systems”, June 2020

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This definition will be the basis of understanding for this work. Three stages, Use Case, Identify Value Exchange, Identify Value Flow.

He also presented a diagram on Value exchange for grid outage avoidance.

In summary, a report will be completed by Sept. 2021. The team will use a UML based tool as a guide for decisions and strategies.



### Summary

- A resilience services and valuation framework is proposed using TES business value diagrams principles
- The proposed work achieves this by:
  - Defining use-cases to identify functional relationships and tasks of the actors
  - Value exchange identification among the involved actors
  - Value flow and activities related to it among the involved actors
- Deliverable:
  - Report
    - ✓ Draft: 08/01/2021
    - ✓ Due: 09/01/2021
- Future Work:
  - A UML-based tool to guide resilience-related decision and strategies deployment, simulation setup and post processing of results

Jeff Morris asked about circuits below sub-stations. He asked if they are keeping things technically agnostic? Sarmad replied saying you could do this (diagram) technology by technology. There is a step where you define the actors and how many for your analysis.

Jeff then asked if it is specific. Hayden said they are trying to keep it fairly general with value exchanges and functionality. It might have to be adapted for specialized technologies later on.

Lorenzo Kristov asked about threats that they are defending against and asked if they are specific? He asked how does the probability of occurrence factor in such as with a 1 in 10 year outage requirement?

Sarmad replied that avoidance of an outage is the work we are trying to write to this report. Avoidance outage is a probabilistic method. We identify if there is a functional form to it and liability criteria are usually already included. They have not looked into specific threats in this. He said that it's written

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more like potential threats to avoid and he said that it is an evolving concept. Reports come out every month. It is daunting to come up with a generic template; it is a tradeoff of what we know and don't know. GWAC could help his team to refine this model. He said more eyes can help with the refining process.

Hayden agreed and said they are hoping to make it relevant to industry.

Lorenzo asked if it is grid resilience? He tends to think from the end use customer perspective. Some end uses are critical. He noted that the with probability assessments there is the possibility that the grid will fail for some period of time. End-use customers need a way to operate some things when the grid fails. He asked if they are only looking at grid resilience or end use customers also? He said that a customer-centric approach might need to include on-site backup for example.

Sarmad said that he's glad everyone is interested in the slides as well as templates – good motivation for us to make the native diagrams available.

Hayden said this is a big space and PNNL has other work in this area. They are looking at how to bring resilience into the operations process. He noted that equity is a question of growing importance, how to add resilience to certain systems.

Karen invited Sarmad to share this information with GWAC. He agreed and will get something to her. He also discussed IRPs and demand flexibility, functional relationships, resilience.

Karen thanked Sarmad and encouraged him to provide any additional materials to the Council.

### **GWAC Ongoing Technical Products and Research**

Karen reminded all GWAC Council members to attend the TESC 2022 organizing committee meeting this coming Monday if they can.

Karen said that she expects to be able to send the Council a link to the website soon before it is officially published.

David said the website content needs to be approved by GWAC.

Ron Cunningham said the Future Grid white paper group is reviewing assessments from seven sources and may have a couple more to review soon in support of the white paper. They are working on a draft to be ready by the middle of July. There is a lot of content they are trying to bring from a GWAC perspective. Also, GMLC emerging issues are part of the content. He hopes they can get some material from TESC 2020. He said that whatever he can glean from the conference would be helpful. Karen said that she has some of that material that she will share at the next white paper meeting.

**Action:** Karen to provide Ron Cunningham with some materials from the TESC 2020 meeting.

David Forfia noted that his social media post is nearly complete - if he can release it in parallel with the release of the new GWAC website he will. After that will come additional posts. He has three people on

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point for the next three posts. After that Gerald Gray is planning a post thanks to David's arm twisting efforts.

David said in reply to Ken Wacks that the posts are more written to the general technologist level.

Lorenzo said he has not been able to communicate with the subcommittee for about a month but he has been looking into the policy realm with Mark Paterson in Australia. He said new rules on DSO models that ask architectural questions have been coming out in California. He hopes to reconvene his subcommittee in the next couple of weeks.

Stuart McCafferty said that writing assignments have been set up on the decarbonization working group. He's gotten some information back from Ron B. and they are working on the first part of the document to refine the messaging. There is a meeting next week.

Ron B. said that his piece might be something that he could create a social media post about and noted this to David Forfia. They will discuss further in the next week.

**Action:** Ron B. and David F. to discuss a social media post

Karen noted that she is working with Seemita Pal, PNNL and Rohit Jinsiwale, PNNL on a Grid Architecture - Practical Users Guide. They will bring their ideas to the Council to review and perhaps some GWAC participants can become involved with the drafting of this new white paper. Seemita said it will be useful for various stakeholders in different areas. They hope to provide some real world examples as well. GWAC participants could help contribute from their own perspective which would really help reach the objective of the paper. Seemita thought a separate meeting on this paper with GWAC might be helpful.

**Action:** Circulate the white paper on Grid Architecture - Practical Users Guide to the GWAC participants.

**Action:** Please let Susie or Karen know if you would like to participate in a meeting on the Grid Architecture paper.

Karen showed a new set of history slides provided by Ron Bernstein.

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**Progress & Accomplishments (NEW from Ron B)**

- 2006 – Interoperability Constitution
- 2007 – Interoperability Decision Maker's Checklist
- 2008 – Interoperability Context Setting Framework
- 2009 – Interoperability Benefits Papers
  - *Environmental Benefits*
  - *Financial Benefits*
  - *Reliability Benefits*
- 2010 - Interoperability Decision Maker's Checklist update
- 2011 – Smart Grid Interoperability Maturity Model Beta Version  
Electrical Power Engineering Academic Landscape
- 2007-2012 – Grid-Interop Forum

Ron said that he extended the existing slide to go out to 2020. He said some items have been updates of earlier documents such as the Decision Makers Checklist. He said this shows on-going activities. He was impressed that 4 docs came out in 2020. He said this shows thought leadership and encourages interest from outside groups.

**Action:** Karen and Susie to add some links to work products on this GWAC history slide

Karen mentioned that Jaime Kolln, PNNL was not able to attend today but they have citations of GWAC work products.

Ken asked about publishing any of the new products as resources as a resource for standards internationally. Karen asked the group to think about it and suggest. Ken said that it would be good to decide before the September meeting.

Ron B. said a link to the new GWAC website would be good to add to the slide.

Ron C. asked if there are other articles and news feeds written by GWAC authors that could be linked to. Ron mentioned ANSI and NEMA. He said that he is referring to citable items.

Karen will look into finding these for such a purpose.

**Action:** Karen will look for publications by GWAC authors.

Karen noted that Sarmad's slides will be posted in the chat once they become available.

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Karen asked for any other topics today.

David Forfia asked for a motion to adjourn. Gerald Gray gave a motion and Ron Bernstein seconded the motion to adjourn. With no objections, David Forfia adjourned the meeting at 11:48am PST. He noted that the next meeting will be Wed. July 21.

### **Attachment:**

Additional Liaison Materials from Aaron Smallwood - Smart Electric Power Alliance (SEPA)

Updates to GWAC – June 16<sup>th</sup>, 2021

### Programs:

- SEPA's inaugural Hydrogen Power conference, H2Power, co-hosted with EPRI, began yesterday and is finishing today: <https://sepapower.org/h2power/> Themes include:
  - Regulator/stakeholder engagement
  - Impacts on complementary sectors like natural gas
  - Benefits to consumers
  - Emerging grid-integrated revenue streams
- SEPA's Grid Evolution Summit is scheduled for July 26 – 28<sup>th</sup>: <https://sepapower.org/grid-evolution-summit/>
  - Virtual only this year
  - Themes include:
    - Utility programs, processes and structures that accelerate clean energy
    - Incentivizing carbon reduction throughout the energy system
    - Accelerating innovation through external partnerships
    - Stakeholder engagement – the ultimate non-wires solution
    - LMI customer clean energy programs
    - Demand Flexibility programs
- North American Smart Energy Week: BACK IN PERSON – in New Orleans, LA Sept. 20-23: <https://www.solarpowerinternational.com/north-america-smart-energy-week/>
  - Includes:
    - Solar Power Int'l
    - Energy Storage Int'l
    - Wind Energy Int'l
    - Smart Energy Marketplace + Microgrid
    - H2+FCI Int'l (Hydrogen Fuel Cells Int'l)
    - SEPA Technical Symposium
  - Expecting attendance on par with our last in person NASEW (2019 in Salt Lake City), around 20,000.

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### Technical Projects:

- Working Groups (selected highlights):
  - EV Fleet Managed Charging Use Case and Interoperability Profile in development
  - Ahmed Mousa (PSEG) is now Chair of the SEPA Cybersecurity Working Group. Seemita Pal (NREL) and Danish Saleem (NREL) will be guest cybersecurity speakers in July and August
  - Grid Architecture Primer highlighting utility and regulatory relevance in development
  - Grid Ontology work continues – working on examples of standards harmonization, defining the relationship to the GMLC Grid Architecture effort, and defining a demonstration using the taxonomy ontology building blocks
  - Energy Storage Q3 2021 theme is Battery Life Cycle, focusing on supply chain, siting/permitting & safety, and end-of-life/recycling/re-use
- Catalog of Standards:
  - Three candidate standards for 2021 are undergoing evaluation:
    - IEEE 2030.7 (Microgrid Controller)
    - IEEE 1547.1-2020 (Conformance to 1547)
    - Orange Button data taxonomy
  - Later this year SEPA will replace the Catalog of Standards with a new database and user interface

Please reach out to Aaron Smallwood with questions: [asmallwood@sepapower.org](mailto:asmallwood@sepapower.org)