

Meeting Minutes

April 23, 2025

GWAC Members

Ron Bernstein, GWAC Chair and President,
RBCG, LLC (*attended first part of the meeting*)

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

Ron Ambrosio, Independent Energy
Transformation Professional

Shawn Chandler, Director, Guidehouse

Marc Costa, Sr. Director & Chief Architect,
Power & Grid, Schneider Electric

Yashar Kenarangui, Xcel Energy

Matt McDonnell, Current Energy Group,
Managing Partner

Mark Ortiz, Sr. Director & Chief Architect,
Power & Grid, Schneider Electric

Aaron Snyder, Dir. of Grid Technology
Consulting, EnerNex

Leonard Tillman, Partner, Balch & Bingham, LLP

GWAC Associates & Emeritus

Rahul Bahadur, GWAC Associate

Ron Cunningham, GWAC Emeritus

Mark Knight, GWAC Emeritus

Lorenzo Kristov, Emeritus

Ken Wacks, GWAC Emeritus

GWAC Guest Speaker

Axel Pearson, PNNL

GWAC Friends

Lisa Affolabi

Ben Ealey, EPRI

Peter Fitzgerald, INS Eng.

David Holmberg, NIST

Jeff Katz, Consultant

Stephan MacDonald, EnergyProfit, LLC

Alaa Mahjoub, Independent Digital Business
Advisor

Harry Peterson, Siloxit

Tim Schoechle, Colorado State Univ.

David Wollman, NIST

PNNL Support

Jaime Kolln, PNNL GWAC Administrator

Susie McGuire, GWAC Coordinator

Grace Borland, GWAC Financial Coordinator

29 attendees

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Chair Ron Bernstein called the meeting to order with 20 attendees having reached quorum.

Jaime Kolln played the Proprietary Information Notice.

Jaime noted that the meeting will be recorded for purposes of note taking and for the recording of guest speakers for later review and if permissible, for posting on the GWAC You Tube channel and GWAC website.

Jaime will let David Wollman go early today with his Liaison report.

Jaime noted that everyone on the call (other than PNNL) is a volunteer to the GWAC other than the PNNL staff.

The group discussed the March minutes and will postpone the approval to the April meeting.



Agenda

Call to Order and Roll Call

- Welcome

GWAC Administrative Business

- Minutes
- Upcoming events
- GWAC Accomplishments
- Action Items

Guest Speaker – Axel Pearson, Project Manager, PNNL

Future Activities

- GWAC Strategic Outreach Plan
- Planning 2025 GWAC Tutorials

Work Product Status Reports

- Working Party Status Update
 - 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 Transportation Electrification
- Liaison Reports

New Business

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Conferences and Events



Date	Event	Location	Attend	Speaker	Topic
Mar. 19-20, 2025	RE+ Microgrids	New Orleans, LA	Kay Aikin		policy meeting on 3/18
Mar. 24, 2025	Smart Energy Consumer Collaborative Consumer Symposium Paired with PMLA	Dallas, TX	Jeremy Roberts		Shaping the Future: Consumers and the Energy Movement
Mar. 24 - 27, 2025	DistribuTECH	Dallas, TX	Forfia, Rahimi, Kolln, Yashar Kenarangui		
Mar 25, 2025	Green Button Alliance's Annual General Meeting	Dallas, TX	Jeremy Roberts		
Mar. 25-26, 2025	Smart Energy Summit	Dallas, TX	Ken Wacks		Co-located with DTECH
April 14 – 17, 2025	IEEE Energy & Policy Forum	Washington DC			Formerly ISGT North America
April 15 – 17, 2025	Microgrid Knowledge Conference	Dallas, TX			
May 6-8	V2G Energy and Policy Forum	San Ramon, CA	Jaime Kolln		
July 17 – 20, 2025	NARUC Summer July 27 – 30, Boston, MA	Boston, MA	Kay Aikin		Shape the Future of Utility Regulation
July 27 – 31, 2025	IEEE PES General Meeting	Austin, TX	Farrokh Rahimi, Jaime Kolln, Lorenzo Kristov, Kay Aikin		
Sept. 8-11, 2025	RE+	Las Vegas, NV	Jaime Kolln		GWAC Tutorial on Monday, Sept. 8
Oct. 22-24, 2025	ASHRAE Building Decarbonization Conference	Chicago, IL			
Oct 26 – 28, 2025	North American Power Symposium	Hartford, CT	Jeff Katz		

Kay Aikin gave a quick recap of the Microgrids conference. The conference was fairly well attended for an inaugural event. There were good discussions. There were some uncertainties among attendees about the future of microgrids.

Jaime attended DistribuTech in Dallas and had gotten to talk to several GWAC members there. He was looking primarily at control centers and at equipment for the PNNL Electricity Infrastructure and operations center. This center will be one of the tours at the May Face to Face meeting at PNNL.

Jaime said that he did see that there was a lot of energy storage solutions displayed at the meeting.

Jaime also noted that OATI had a very large display booth at DTech, and he added that they partnered with other vendors as well.

Kay and Ken each said they thought it was the largest vendor booth at DTech.

Jaime said that Green Button Alliance was there as well. We can ask Jeremy Roberts about it.

Ken Wacks attended the Smart Energy Summit, which was co-located at DTech. Ken noted it was a good meeting, there were many papers, and it was well attended with a lot of information on cyber security.

Jaime said the Energy Policy Forum held in DC had about 200 attendees this year. It replaced ISGT North America. It seemed to go well but he was in town for another purpose.

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Jaime asked if anyone wanted to share information.

Shawn Chandler mentioned the Advanced Clean Transportation Conference (ACT) in Los Angeles will be held April 28 - 30. Shawn will attend but is not presenting.

Ron Bernstein will attend the ASHRAE summer meeting in Phoenix, AZ and will give a talk on specification development in buildings and buildings to grid. He will update GWAC after the meeting. ASHRAE Annual Conference, June 21-25, 2025, in Phoenix AZ.

NIST Liaison Report

Dave Wollman announced that he has accepted early voluntary retirement from NIST and will be leaving federal service at the end of April. NIST is in the midst of reorganization. His division will not exist in the future. He noted that Smart Grid is considered Legacy and is being eliminated as a topic area.

He plans to take six months off and then will decide what to do next. He appreciated the good history that NIST and GWAC have had and happy to have been a part of it.

Dave noted that the smart grid program had been eliminated a few years back, but he and Avi had kept a few things going. The Framework Version 4 is out there as something they were able to contribute to the Community.

Ron Bernstein noted for Dave that as non-NIST he could apply to join the Council.

Jaime invited Dave to give us his contact information and he can keep attending.

David will be stepping down as the GWAC NIST liaison. He didn't think it was good to name a new NIST Liaison at this time due to NIST's changing priorities.

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GWAC Accomplishments

- 2024 – [Future Electric Power Industry and Grids – Now What Again is Our Destination?](#) (NEW)
- 2024 – [A Practical Introduction to Common Grid Architecture Techniques](#) (NEW)
- 2023 – Current GWAC [Speaker Video Presentations](#)
- 2015-2022 – [Annual Transactive Energy Systems Conference](#) (since 2019, IEEE PES partnership event)
- 2022 – [Blog Post #5 – Decarbonization efforts of three Northern California CCA's](#) - Bahadur
- 2022 – [Blog Post #4 - Decarbonization of the Electric Grid](#) – Bernstein
- 2022 – [Blog Post #3 - Energy Equity in Decarbonization](#) - Negash
- 2022 – [Blog Post #2 - Grid Infrastructure Challenges In A Decarbonized World](#) – Aikin
- 2021 – [Blog Post #1 - Decarbonization – The Pattern that Has Emerged](#) - McCafferty, McCormick, Forfia
- 2020 – [Transactive Energy FAQ](#)
- 2020 – [Smart Buildings as a Transactive Energy Hub](#)
- 2020 [Decision Maker's Interoperability Checklist v.1.6](#)
- 2020 – [Reliability and Resilience Considerations for TE Systems](#)
- 2019 - [GridWise® Transactive Energy Framework V1.1](#)
- 2018 - [TE Systems Research, Development and Deployment Roadmap](#)
- 2016 - [TE Decision Makers Checklist](#)



GWAC



Jaime reviewed the publication list and called out some of the more recent ones. He also noted that the videos are back up on the GWAC Video site and encouraged everyone to check out the video presentations out there.

He also noted the series of three short videos that describe the functions of the GridWise Architecture Council produced by PNNL Communications which are also on the YouTube site.

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Action Items

- Send speaker ideas to Jaime Kolln and Ron Bernstein and copy Susie McGuire.
 - Added an “About the Council” slide to template
 - Slide deck templates are available to GWAC members.
- Liaisons
 - GWAC is looking for a liaison to the GridWise Alliance to foster better interactions between the two groups
- Website updates
 - Continue to add video presentations including speakers to GWAC database bureau post on the website.
 - Feedback requested on format, etc.
 - GWAC and Emeritus GWAC to review their bios from the website and update if needed.

wollman, David A. (Fed) (Unverified) 10:25 AM

DW Personal contact info for David Wollman
david.wollman@yahoo.com
personal cell: 301-956-3839

Jaime asked if anyone is active in the GridWise Alliance, saying that the GWAC needs a Liaison for that group. He said that GWAC currently seems to have lost touch with them. Both GWAC and the Alliance were created at about the same time, and we share the GridWise trademark.

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Ronald Cunningham (Unverified) 10:25 AM

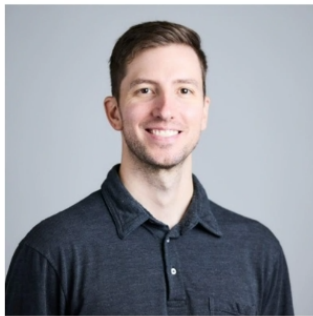
RC SEPA GAWG" Grid Architecture Primer is also a decent resource.
<https://sepapower.org/resource/grid-architecture-primer/#:~:text=The%20primer%20describes%20and%20provides%20references%20to%20necessary,changes%20of%20the%20grid.%20SEPA%20Grid%20Architecture%20Primer.>

Jaime introduced Axel Pearson, PNNL, today's guest speaker.



DOE's Energy Skilled Program and the Operations Technology Workforce

Axel Pearson, Project Manager, Pacific Northwest National Laboratory



Axel Pearson is a Project Manager at Pacific Northwest National Laboratory, leading the Integrated Lighting Campaign and commercial building workforce development efforts. Axel has experience with codes and standards development, lighting auditing, utility incentive programs, and energy education. Axel holds a bachelor's degree from the University of Colorado in Environmental Studies and a master's degree in Environmental Management from the University of San Francisco. He holds the Project Management Professional (PMP) credential and is Lighting Certified (LC) by the NCQLP.

Axel said he works on this with Ron Bernstein. He's not very familiar yet with GWAC. He is a project manager, and his tech of choice is lighting. He has about 12 years with Lighting Controls. Integrated Lighting Campaign may experience some changes with the new administration. And he will also tell us about the energy skills program today.

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DOE's Energy Skilled Program and the Operations Technology Workforce

Axel Pearson
April 23, 2025

U.S. DEPARTMENT OF
ENERGY **BATTELLE**
PNNL is operated by Battelle for the U.S. Department of Energy



Agenda

- Energy Skilled Overview
- Current Recognition Pathways
- Partnership with Google
- Commercial Expansion
- Operations Technology
- Discussion



Alex is hoping to get some input from the Council today on this program.

They work with Residential and Commercial buildings and are hoping to expand it. The program is about two years old.

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The Department of Energy (DOE), through its Energy Skilled program, recognizes credential programs that are preparing workers for meaningful and in-demand job opportunities in building energy efficiency. Energy Skilled recognition is given to training programs and certifications that align with Building Science Education program topics. Pacific Northwest National Laboratory manages the Energy Skilled recognition program on behalf of DOE.

Below are the recognition categories and criteria, as well as instructions for applying for recognition.

About Recognition

PNNL website for the Energy Skilled Program.

Energy Skilled Overview

Energy Skilled **addresses skill gaps** in the energy workforce through:



Recognition

For certifications, training programs, degrees, licenses



Training Content

Building Science Education Solution Center






Skill Standards

Informed by industry, credentialing bodies

[Energy Skilled Recognition | PNNL](#)

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Heater Manufacturers Action Council (ESMAC)		TECH & ESMAC Heat Pump Water Heater Education	HPWH Installation
Barnett Plumbing & Water Heaters		Barnett Plumbing & Water Heaters Training Program	HPWH Installation
A. O. Smith University		Voltex® AL Smart Heat Pump Certification Premier® AL Smart Heat Pump Certification Proline XE® AL Smart Hybrid Electric Heat Pump Water Heater Certification	HPWH Installation
Urban Green Council		Heat Pump Water Heating Systems Installation for Plumbers	HPWH Installation

What is Energy Skilled Recognition?

Learn more about how DOE distinguishes credential programs that prepare workers for meaningful and in-demand job opportunities.

[Learn More About Energy Skilled](#)

Recognized Heat Pump Programs

Energy Skilled-recognized heat pump programs equip contractors to install or evaluate high quality, next generation heat pump systems.

[View Energy Skilled-Recognized Heat Pump Programs](#)

Recognized Heat Pump Water Heater Programs

Recognized Energy Assessment Programs

Workforce Development

The program does not recognize individuals, but it recognizes training and certification programs that meet the standards of DOE.

The skills are for buildings for now, but they hope to expand.

Education content is freely available.

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Current Recognition Pathways



- DOE recognizes training & certification programs that prepare workers for **residential (for now)** energy efficiency careers.

Current Categories:

- HVAC
 - Heat Pump Installation
 - Heat Pump Comfort Advising
- Plumbing
 - Heat Pump Water Heater Installation
- Energy Assessments
 - Single Family Home Energy Audit
 - Multifamily Home Energy Audit

Categories Under Development:

- Residential Envelope & Whole Home
- Residential HVAC Commissioning
- Collegiate Building Design
- Commercial HVAC
- Operations Technology

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He gave an example of Heat Pump installation information.

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Energy Skilled currently recognizes 50 programs! (March 2025)

Recent Recognitions

Organization	Program
PG&E	Heat Pump Water Heater Installation Series
UA Local 22 Plumbers and Steamfitters	UA Local 22 Apprenticeship Program (HPWH)
Fujitsu	Fujitsu Mini-Split Installation Certificate (HP-I)
Slipstream	Slipstream Heat Pump Contractor Training Program (HP-I & HP-C)
Center for Energy and Environment - Minnesota	Recommended Practices for Air Source Heat Pump Installers (HP-I)
Sheetmetal Local 33, Youngstown	Apprenticeship (HP-I & HP-C)
Hot Water Solutions	Heat Pump Water Heaters: Technology Overview & Customer Solutions Training



Axel

7

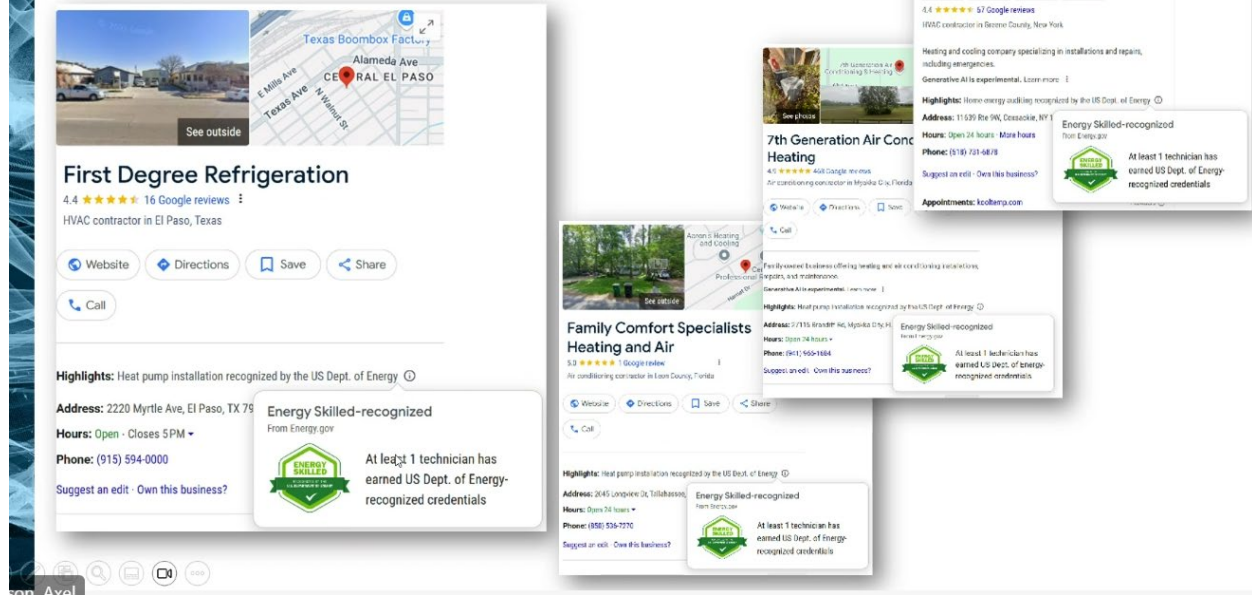
The program launched early in 2024, and they already have 50 programs.

They have a partnership with Google to help with residential related credentialing. This helps to show search results that have the recognition of these certified programs.

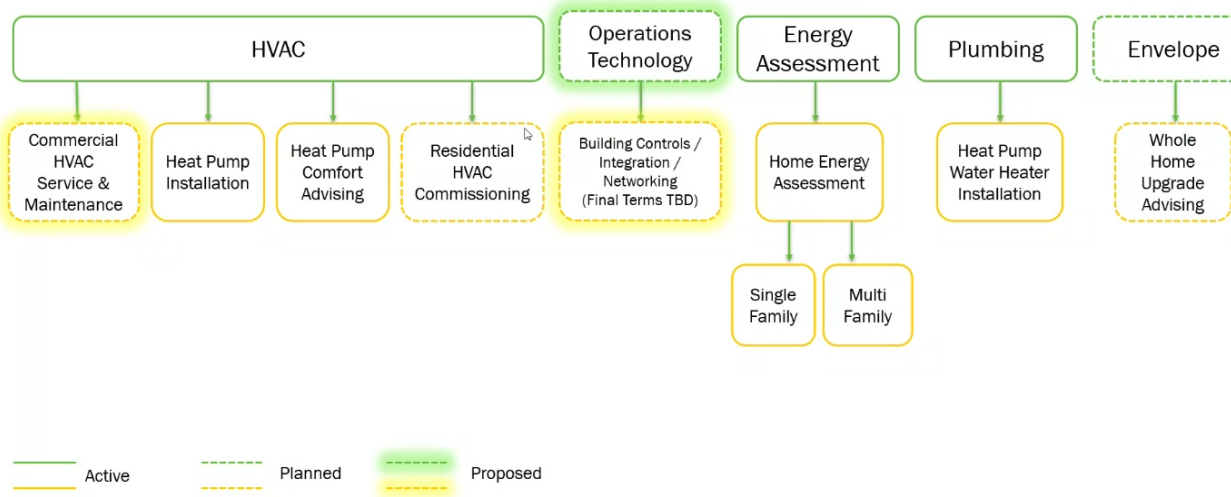
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Partnership with Google Helps Consumers Find Contractors



Proposed Commercial Energy Skilled Programs



Ron Ambrosio asked about skills integration and local distribution grid.

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Axel said Ron Bernstein has been helping them identify some of these skills. He added that the new DOE Secretary Chirs Wright wanted more in the area of security and resilience.

Extending resilience – energy resources, intelligent buildings, residential technologies are key to integration.

Research and Stakeholder Engagement Summary



Axel said that the residential side developed very quickly last year.

Now they are expanding into commercial and have interviewed industry experts and held workshops. He said Operations Technology came on later. He found there is an IT aspects and communications and operations were suggested. Then he learned about operations technology which helped develop the job scope and at that point he was referred to Ron Bernstein.

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Operations Technology

Definition resulting from stakeholder outreach:

Professionals that work with the networks and technology used for managing the physical infrastructure of a building or industrial facility. OT is technology that helps the building operate, as opposed to IT, which helps the people do their work in the building

He noted the contrast in OT and IT.

Ron A said the term OT is well established on the grid side of the meter. OT is more the controls side of physical grid management to contrast with IT.

DRAFT Operations Technology Skill Set

Communication	Communication skills related to the job including written and verbal, ability to read drawing, ability to take meeting notes, create schedules, and summarize team activity.
	Use job-centric tools such as MS Office applications, CAD, MS Project, Bluebeam, and various project management tools.
	Work within a team environment understanding team member roles, responsibilities, and objectives.
Project Management	Understanding of project management responsibilities including managing meetings, agendas, team engagement, technical task assignments, and project planning.
OT Technology	Basic understanding of all building systems including mechanical, electrical, plumbing, security, fire/life safety, power, elevators, and their integration into the building management system.
	Understanding of operational technology for energy efficiency across all building automation and control systems.
	Manage, maintain, diagnose, and report on building control and automation equipment, subsystems, campus, and the use of enterprise level applications and tools.
OT Project	Safely and effectively work on OT project job sites using the proper safety equipment and tools, understand and follow all safety protocols, and support others to follow best practices.
	Basic understanding of owner project requirements, energy strategies, risks and mitigation practices, and use of advanced tools to support efficient energy efficient buildings.
OT Contracting	Ability to create, implement, manage, maintain project criteria, specifications, submittals, costing/pricing, and project contracting related tasks.
	Understanding of industry standards, design guides, codes and specifications.
	Understanding of contractor engagement, divisions of labor, cross domain interaction requirements, and contractor management.
BAS Architecture	Understanding of building automation and control system design, architecture, components, networking, functionality and performance.
Control System Design	Understanding of building control system design including sequences of operation, control logic, control points and equipment design.
	Ability to develop energy efficient HVAC system design, integration, and management.

Axel would be happy to meet with those who are interested and talk more one on one on how to improve this program.

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Marc Costa will send Axel some information from California Office of the Chancellor

Jaime offered to work with GWAC members and friends on using the GWAC PPT template and videos in presentations they give.

Chat question:

Jeff Katz (External) 10:51 AM

JK I understand the GSA has upgraded some federal buildings for energy efficiency, in some cases ahead of commercially owned properties. This includes military bases as part of their resilience. Has your team worked with these program?

OT tends to include actual power engineering skills, as well as I&C



Alex said they have worked with GSA on commercial buildings but not on military bases. This should have some resilience aspects.

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Jeff said that I&C is Industrial and Commercial or instrumentation and controls. Jeff said he is also referring to SCADA skills.

Jaime recognized this program covers a wide range of skills.

Ron Bernstein noted that the skill sets in the Job Task Analysis and also the identification of the stakeholder for that capability. To create the chart the work team looked at job postings and the skills sets required and then worked backwards to create a spreadsheet:

Combined Final	Notes	Stakeholder Engagement Mapping	Level	Basic	Intermediate	Advanced	Energy Skill	General Skill	Owner	Contractor	Installer/Tech	Supplier/OEM	Sector Applicability	Commercial	Office	Medical	Manufacturing	Education
Demonstrate effective communication skills related to job including written and verbal, ability to read, ability to take meeting notes, create schedules, summarize team activity.		General Skills -> Communication	X					X	X	X	X							
Demonstrate ability to use job-centric tools such as MS applications, CAD, MS Project, Bluebeam, and MS project management tools.			X					X		X	X							
Demonstrate ability to work within a team environment understanding team member roles, responsibilities, and times.		General Skills -> Communication	X					X	X	X	X	X						
				X			X	X	X	X								
		General Skills -> Communication	X			X		X	X	X	X							
	Respect, listening.	General Skills -> Communication	X					X	X	X	X	X						
	Calculations, tabulations.		X	X			X	X	X	X	X	X						
Demonstrate understanding of project management capabilities including managing meetings, agendas, engagement, technical task assignments, and project planning.		General Skills -> Finance	X					X	X	X								
			X	X				X	X	X		X						
		General Skills -> Communication	X					X	X	X	X							
			X					X	X	X	X							
			X					X	X	X	X							

A	B	C	D
Curriculum Skill Sets	Combined Final	Notes	
1 Skill			
19 Demonstrate ability to prioritize tasks based on project scope			
20 Demonstrate ability to create a project plan			
21			
22 OT Technology	Demonstrate basic mechanical systems understanding	Demonstrate basic understanding of all building systems including mechanical, electrical, plumbing, security, fire/life safety, power, elevators, and their integration into the building management system.	
23	demonstrate basic HVAC system understanding	Demonstrate understanding of operational technology for energy efficiency across all building automation and control systems.	
24		Demonstrate ability to manage, maintain, diagnose, and report on building control and automation equipment, subsystems, campus, and the use of enterprise level applications and tools.	
25	Demonstrate basic electrical systems understanding		
26	demonstrate basic power systems understanding		
27	Demonstrate basic security systems understanding		
28	Demonstrate basic plumbing systems understanding		
29	demonstrate basic Fire/Life Safety systems understanding		

Ron B. would like to help identify what is missing such as building OT capabilities.

One objective is for education facilities to know what to include in their course curriculum to help train workers for these various capability needs.

Stephen MacDonald asked about the DOL codes. He felt those should be included.

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GWAC Strategic Outreach Plan

- Events
 - RE+ Las Vegas
 - Other presentation?
- Guest speaker recordings continue to be developed and published to YouTube
- Outreach through conference presentations
 - Slide deck developed with template and GWAC outreach slides.
 - Share the deck for "Building Back from the Future".
 - NARUC meeting colocation?
- Other organizations to "cross-pollinate" ideas with.
 - Identify liaison volunteers, e.g. INCOSE

If you will be attending the summer NARUC meeting, please let Jaime Kolln know.

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RE+ 2025

- Next event is in Las Vegas, September 8-11
 - Discussing Monday F2F and GWAC/SEPA Tutorial with Aaron Smallwood
 - Followed by a GWAC + SEPA Mixer!!!



Sept 8 there will be a GWAC event in the morning. The F2F and then the SEPA GWAC tutorial session will run for about 4 hours in the afternoon (1pm to 5pm). Sponsors for refreshments at the mixer after the tutorial are needed.

Jaime recommends booking rooms now. The event should be open to everyone with an RE+ Pass, but we are confirming that with RE+ organizers.

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GWAC F2F at PNNL - Richland Washington

Tues. May 13th	Day 1, 1:00 PM to 5:00pm
1:00pm – 1:30am	Check-in/Badging
1:45am	Welcome: 3820 Current Room
	Tour: Electricity Infrastructure Operations Center https://www.pnnl.gov/projects/eioc
	Tour: Grid Storage Launch Pad https://www.pnnl.gov/projects/grid-storage-launchpad
	Tour: Energy Science Center https://www.pnnl.gov/projects/energy-sciences-center
	<ul style="list-style-type: none"> No Host Dinner: Anthony's at Columbia Point https://www.anthonys.com/restaurant/anthonys-at-columbia-point/

Jaime reviewed the planned GWAC Face to Face meeting tours planned at PNNL. He noted that the the fundamental science supports tour will showcase support for the battery reserarch of the new Grid Storage Launchpad.

PNNL Badges are needed for the tours.

We will have a no-host dinner afterwards.

Jaime showed at outline of the meeting agenda:

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Wed. May 14 th	Day 2, 8:30am to 5:00pm
8:00am – 8:30am	Check-in/Refreshments
8:30am – 9:45am	Topical Presentation: TBD <ul style="list-style-type: none"> • •
9:45am – 10:00am	Break
10:00am – 12:00pm	DOE Presentation <ul style="list-style-type: none"> • •
12:00pm – 1:00pm	Hosted Lunch
1:00pm – 2:30pm	Future of the Council Brainstorming <ul style="list-style-type: none"> • Council relevance and opportunities for impact • Who is the audience and how do we attract them? • Next steps for work products • Future Speakers and Topics
2:30pm – 2:45pm	Break
3:30pm – 4:30pm	RE+ Tutorial <ul style="list-style-type: none"> • Attendees • Topics, Speakers • Additional Activities
4:30pm – 5:00pm	Outreach Strategy <ul style="list-style-type: none"> • Relevant guidance – other tutorials • Webinars
6:30pm	No Host Dinner: Tagaris Taverna https://www.tagariswines.com/taverna-1

For Day 2 Paul DeMartini with Newport Consulting will be presenting on Grid Services, and planning. Paul has been working recently with PNNL and LBNL.

Everyone should have the agenda but if not let Susie know and she can send it to you. Jaime is adding to it, and it will be resent again when it is more complete.

Marc Costa and Jaime Kolln have been talking about some case studies and GWAC work products to benefit a certain application. We will look at the future of the Council and it's relevance. Jaime is hoping to get some good ideas for new work products as some of the current ones are finishing up.

There will be a planning session for the RE+ Tutorial.

Jaime asked everyone to check their schedules and plan to attend.

He noted that Day 2 is a half day meeting so that people can leave in time to catch their flights.

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Thurs. April 15th	Day 2, 8:30am to 12:00pm
8:00am – 8:30am	Check-in/Refreshments
8:30am – 10:00am	Routine Business and Work Product Status <ul style="list-style-type: none"> • Upcoming events • Liaison Reports • GWAC Products Overview Chart • GWAC Website and Social Media Review • Status Reports
10:00am – 10:15am	Break
11:00am – 12:00pm	Wrap up <ul style="list-style-type: none"> • Review Conference Planning Actions • Presentation Takeaways
12:00pm	Meeting adjourned
	Suggestions for Lunch <ul style="list-style-type: none"> • Frost Me Sweet Bistro • Lulu Craft Bar and Kitchen • Perch Cantina • Shogun Teriyaki and Sushi

The virtual invite will go out soon for both days. The audio should be good.

Ron Bernstein asked attendees to coordinate hotel location so that we can share rides.

Kay will arrive on Monday night.

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Grid Architecture for Regulators

- **Team members:** Lorenzo Kristov, Kay Aikin, Larisa Dobriansky, Jeff Morris, Mark Paterson, Farrokh Rahimi, Chris Villarreal, Ron Bernstein, new: Peter Fitzgerald, Marc Costa, Shawn Chandler
- 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: Someday in the future...

Marc Costa gave an update. They have speakers for the next two calls. They will then start putting words on paper and creating a draft. Anyone interested in topics or discussions or as a speaker please contact Marc or Lorenzo.

Jaime would like to see the group set a completion date for this paper. Marc said they would identify a date and get with Jaime on it.

Stephen MacDonald (External) 11:23 AM

SM Suggest speaker [Marc Costa](#) ...
Aloke Gupta or Paul Philips,
CEC and CPUC respective.

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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: Jaime Kolln, Ron Cunningham, Farrokh Rahimi, Mark Ortiz, David Forfia, Aaron Snyder, Lorenzo Kristov, Bhaskar Mitra, Paul DeMartini, Shawn Chandler
- 1:00 PM PT/ 4:00 PM ET, 2nd and 4th Tuesday of the month

Ron Cunningham mentioned FLEET (or LEEP) – for trucks and said that other things that move such as planes and boats are important and may need to be added. They will keep that in mind as they firm up core concepts and taxonomy.

He noted that progress has been slow. The group met this week and made some assignments. Progress is slow.

Ron B. asked about those who can't access the GWAC Teams site.

He said that he has a "mirror" site for those people at the link below and they are welcome to use the site:

ron@rb-cg.com (External) 11:25 AM

R <https://drive.google.com/drive/folders/0BwKAWg1qnPYKNmRyZ2FzYmMyWDA?resourcekey=0-dwxgaUU7oqt7YIHzh5M6QQ&usp=sharing>

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[GWAC - Google Drive](#)

He noted that there are copies of documents at the site.

Jaime noted that Ron Melton participates with this group.



Liaison Reports

- NIST – David Wollman
 - Green Button – Jeremy Roberts
 - EPRI – Ben Ealey
 - IEEE PES – Farrokh Rahimi
 - ASHRAE, DLC (Design Lights Consortium) – Ron Bernstein
 - ISO/IEC, IREC – Ken Wacks
 - SEPA – Aaron Smallwood
 - NARUC – Jeff Morris
- *Are there other organizations we should be hearing from?*

Ben Ealey – EPRI; this is his first meeting as the GWAC Liaison. They had a call last week with utility members. They got a lot of questions about the matter of protocol. With smart meters supporting wi-fi connectivity it is something we are going to take a closer look at; what a grid-centric use of matter would look like. Matter is an IoT protocol that allows for many of the different ecosystems that are out there to be pulled together. It also supports a number of different physical layer technologies. If enough members are interested, we will hold a meeting about it.

Ron Ambrosio asked if it is intelligent meters?

Ben said it started out broader than that, but they found it would be good to start at the meter, AMI 2.0.

Ron Ambrosio agreed that meters are a good place to start.

Jaime asked Ben to try to listen to the GWAC F2F meeting. On Day 1 Mark Ortiz will give a talk on grid architecture and meters that he might find interesting.

Jaime asked about the Flex-It program.

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Ben said that the Flex-It effort will standardize the interfaces for aggregators and create a registry of DERs that could be available for aggregation. Many third-party aggregators are interested in having some type of tool to make integration of their resources easier. About 20 or so members have joined the effort. Main protocols would be 2030.5 and open ADR 3.0.

He will send a link if public involvement is possible.

IEEE – Farrokh Rahimi is out today.

Jaime noted that the IEEE Energy Policy Forum in DC went well with over 200 people attending.

Ron Bernstein – ASHRAE – since the recent publication of a major revision of specifications of building controls and systems, there are new efforts underway of enhancing two areas of the document. One is on the visualization and user interfaces graphics on how operators and owners interface with different systems. So, they are trying to come up with some different standardized methods for doing that. Following along the lines to some degree the industrial concept of high-performance graphics. So, this is a team that is looking to develop an addendum to some of the standards that would be related to how to implement the best practices on user interfaces. So that may have some interest for some folks.

The second one that has come up is now that we have a really good go forward strategy for design of integrated environments. We don't have a really good handle on integrating legacy systems. So, all of the things that exist currently in buildings and you know, I would even say building/grid interfaces, how do we deal with something that's already out there and where there's no budget to really upgrade or enhance what's there? How do we deal with legacy systems in a way that allows us to move forward? The group has some strategies in mind for that.

There's a group that's forming specifically on that topic. Most of the low hanging fruit out there is on legacy systems and bringing them more into the current environment.

Both efforts are within the ASHRAE committee. There will be meetings on these topics at upcoming meetings. If anyone wants more information, please contact Ron Bernstein.

Design Lights Consortium – Ron Bernstein: DLC had a webinar a couple weeks ago that Ron B. was involved in. It drew a large audience of a diverse group. Many were building integrators and vendors, and energy efficiency program managers.

Ron Bernstein added that HMI work is about looking at the best ways to do things; not necessarily to tell vendors how to do it, but the best practices for harmonizing interfaces for different job descriptions. It sort of goes back to what Axel was talking about earlier on the job description.

Such as if a lower-level engineer maintenance technician wants to see something different than an engineer or a manager or an energy efficiency person.

We have to create an environment that allows that to happen and some of those best practices are, graphic overlays, reducing functionality, limiting 3D and distracting things on graphics.

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The group has done quite a bit of work on that, hopefully by the end of the year, we'll have something in a draft form.

Jeff Katz (External) 11:35 AM

JK Ben has been on the 2030 meetings. I drop in some time because I was the IT Task Force Leader of the original (IEEE 2030-2011)



Kolln, Jaime T 11:36 AM



Doug Houseman was on earlier and is Chair, I believe.

Ken Wacks – ISO/IEC: The work group on SC25 JTC 1 which is jointly managed by ISO and IEC, is continuing to extend the repertoire of 12 energy management standards including the two GWAC transactive energy documents that are now official IEC reports.

ISO and IEC published framework for energy management including the specification for the AI based energy management agent or EMA, we're now expanding the gateway function to be a platform that hosts the energy management agent.

We had a week of meetings at the beginning of April, and we will continue our Spring meetings the third week in June.

The fall meetings will be hybrid with remote access to the fall meeting to be held in Paris France in October.

Ken Wacks -IREC. Ken chairs the Customer Grid Edge committee. They are approaching the 90th meeting. The group started in 2020. For this Friday the featured speaker is Michael Bahtiarian with Acentech, an acoustics company. He will be speaking on "how to be a good noise neighbor." He'll specifically address how to deal with noise producing elements associated with DER such as solar, wind and battery energy storage systems.

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The meetings of the customer grid Edge that are held twice a month on Friday afternoons have become very popular.

Everyone is welcome to attend. There is no charge to attend. Search for IREC CGE to find the schedule.

Ron Bernstein asked about CTA.

Ken said he is primarily on the cybersecurity side, and he continues to chair the energy management side. Currently in energy management, we're working on the 3rd edition of the CTA 2045, known as the Modular Communication Interface, which is used primarily to equip water heaters with interfaces for demand management run by utilities. It's now mandated on all new water heaters in the states of Washington and Oregon. California is considering it.

R7.A is now a standalone committee. R7 is dissolved.

CTA Ken is involved in the cybersecurity committee. CTA is working with the federal government on the Cyber trust Mark, which is being deployed this year to provide a minimum level of assurance to consumers when they buy products that the products have a minimum level of cyber security built in.

The FCC is responsible for issuing the cyber trust mark, which will be on packaging with a QR code. For more details for consumers, learn about the product they're buying.

Ken is also involved in machine learning cybersecurity standards. We're learning all sorts of materials about how to protect the datasets that are used to train AI machines so that they don't get led astray by faulty data.

Ken will be the new CTA Liaison

Jaime said that the data on the AI cybersecurity is very interesting, and we may need to discuss it more at another meeting.

Ron Bernstein added another ASHRAE item: The S223P Group, which is the modeling, taxonomy metadata and shackle file creation team that work. I think we've been working on it for almost two years now. Is going out for its public review. Probably in May.

It will be called the BACKNET committee. It's a back net subgroup task.

Ron Ambrosio - SEPA - Research Advisory council met recently and were looking at reviewing the SEPA strategy work. They are looking for new areas to move into. They want to get more interactions between the working groups. They have the working groups present on current activities regularly to keep everyone informed on what is going on.

The Grid Architecture work group will now meets one Tuesday per month.

Jaime said that the work groups and their meetings times are posted on the SEPA website.

Some groups have changed their times.

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IF you join a work group you will get access to the invite list.

Stephen MacDonald said he recently gave a presentation to SEPA's Energy Interoperability working group and he would be happy to present it to the GWAC.

Jaime will add Stephen to the future speaker list.

Ron B. noted that Peter Detwiler is also on the future speaker list.



Adjourn



Next GWAC Meeting: F2F Richland WA May 13-15th, 2025 <https://gridwiseac.org/>