

Meeting Minutes

Sept. 14, 2022

GWAC Members

David Forfia, GWAC Chair

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

Ron Bernstein, President, RBCG, LLC

Andrew Bordine, VP Energy Mkts & Innovation,
Anterix

Marc Costa, the Energy Coalition

Ron Cunningham, IT Enterprise Architect,
American Electric Power

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

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

Ahlmahz Negash, Sr. Power Analyst, Tacoma
Power

Paul DeMartini, Managing Partner, Newport
Consulting

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.

Ken Wacks, Home, Building & Utility Systems

Mark Knight, 1898 & Company

Tim Schoechle, CSU Faculty

David Wollman

GWAC Friends

Abdelrahman Ayad

Toby Considine

Sean Crimmins, EPRI

Lisa Gilmour

Jaime Kolln

Steffi Muhanji

James Orenstein

GWAC Members and Assoc. not present

Ron Ambrosio, Independent Energy
Transformation Professional

Mark Paterson, CSO, Strategen

PNNL Support

Susan McGuire, GWAC Coordinator

Ron Melton, Acting PNNL Administrator

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Ron M opened the meeting and read the proprietary information.

Agenda Sept. 14, 2022

Call to Order and roll call

GWAC Administrative Business

- Welcome
- Minutes
- Upcoming events
- Actions

Presentation: Steve Widergren, PNNL – SEPA TE Concept Model Overview

Status Reports

- GWAC Projects Overview Chart review
- Working Party Status Updates
 - Grid Architecture White Paper
 - Grid Future State White Paper
- Liaison Reports

Ron Bernstein asked the group if anyone had any edits for the July and August GWAC minutes. Ken Wacks had submitted a minor edit and Susie confirmed the change had been made. The group approved both sets of minutes with no objections.

David Wollman, NIST said that he would need to leave the call early today and added that he had no liaison report today but will have one at the F2F meeting.

Ron Melton introduced Steve Widergren, PNNL as today's guest speaker.

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Transactive Energy Concept Model Overview

A SEPA Transactive Energy Working Group Work Product

GridWise® Architecture Council Meeting
14 September 2022
Steve Widergren, PNNL

Steve Widergren described the SEPA Transactive Energy Work Group led by Mark Knight.

Steve started by saying this effort started with the idea to develop a set of common terminology with Transactive Energy (TE) principles behind it.

Topics

- What is a concept model?
- Purpose of TECM
- The knowledge graph
- Concept definitions
- Using the TECM – Case studies
- Next steps

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What is a concept model?

TECM: a representation (or abstraction) of concepts relevant for conveying a transactive design that is consistent with the distributed decision-making principles and basic functionality of TESs*.

- TECM is composed of terms, definitions, and loose relationships between the terms
- Concepts cover elements common to describing TESs
- Model does not stipulate how to design a system – it is non-prescriptive, not an architecture
- Model covers high-level concepts knowing that TES designers use various design methodologies
 - E.g., UML, entity-relation, E³-Value, RDF/OWL

Steve sent me the presentation and said that I can distribute it to the GWAC.

Case Studies selected were the ones familiar to at least some of the work group members. Finding and mapping the cases and they then looked at the design structure.

A white paper has been created from this work.

Case Studies

- Evaluate the effectiveness of the TECM terms to describe different TES designs
- Format
 - Overview
 - Participant types
 - Pathways: transaction and conduction
 - Transactive agent interfaces
 - TE mechanism
 - Flow constraints

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Case study insights

- All cases can be described using TECM terminology
 - Terms are different but good similarity
 - Coverage reasonable but potential for expansion of model, e.g.,
 - Multiple market products being transacted (e.g., day-ahead and real-time energy)
- Participants and transactive agents: clarified how design is structured
- Pathways
 - Clarified design decisions like star, meshed, and nested networks
 - Separates the transaction pathways from the electric conduction assumptions
- Mechanisms: clarifies price formation
- Flow constraints: clarified if design handles them, e.g.,
 - Brooklyn microgrid did not address them
 - TeMix used a separate delivery check to prohibit transactions impacting constraints

Next Steps

TECM task force workplan

- A. Debrief meeting held this morning
 1. Resolved final review comments on TECM SEPA whitepaper
 2. Review task force experience
 3. Identify future actions
 - a. Adoption within SEPA task force work products
 - b. Collaboration with others (such as GWAC)
 - c. Explore formal information modeling and standardization
- B. SEPA to distribute final document

Toby Considine mentioned the Florence School of Regulation and privacy protection issues with regard to this discussion.

Steve Widergren said that this effort was meant to be inclusive and not critical. They purposely did not try to have a debate about different ideas. The authors wanted to provide descriptions and not critique policy or the benefits of one design over another.

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Paul DeMartini noted a global effort possibly from the IEA on Social License to automate that speaks to what Toby Considine mentioned, with some activities in Australia and Europe. He asked what the parameters of the system would need to do to protect privacy and he noted as more important, to enable customers to understand what they are signing up for. He noted that some customers in Colorado, as an example were surprised to be locked out of their thermostat. He said we need to engage customers that will participate so they are fully aware of what to expect in various conditions. He expects to see a publication about this issue to be coming out next year. He said the area is evolving and that policies for addressing privacy may be required as well as the social license to automate the concept.

Steve said this work could be a starting place from which to dive into an area like privacy. The model could be supplemented with other terms, ideas, and concepts appropriate for another scope of discussion. He said the authors wanted to keep it simple and stick to the basics.

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PM

Paul De Martini (External) 9/14 10:33 AM

Hi Steve, did you have an opportunity to look at Recurve's model in California or NODES in EU?


MC

Marc Costa (External) 9/14 10:34 AM

this reminds me of the work we did with LBNL to create BEDES - the building energy data exchange specification..

RC

Ron Cunningham (Guest) 9/14 10:36 AM


skos - Simple Knowledge Organization System - a W3C standard. The TECM leveraged skos, but took some liberties on not following exact skos sdt syntax to ease a laymen read.  2

TC

Toby Considine (External) 9/14 10:40 AM

Florence School of Regulation (EU Energy thinktank) considers central TE markets as unredeemable in terms of Privacy protection--is this thinking going into the consideration of TE models?

DF

David Forfia (External) 9/14 10:40 AM  2

[Home - NODES \(nodesmarket.com\)](https://nodesmarket.com)

TC

Toby Considine (External) 9/14 10:46 AM

I hope the TECM graph is available ...

MC

Marc Costa (External) 9/14 10:46 AM

has there been any consideration of how to standardize the evaluation of TE systems? Whether having an IPMPV like standard, UMP.....or are TE systems inherently transparent and using data such that counterfactual information isn't needed?

MK

Knight, Mark R. (Guest) 9/14 10:47 AM

also "mechanism" is a catch-all non-specific concept to address how transactions occur so security and privacy may have mechanisms that are covered here

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MK Knight, Mark R. (Guest) 9/14 10:47 AM
also "mechanism" is a catch-all non-specific concept to address how transactions occur so security and privacy may have mechanisms that are covered here

MC Marc Costa (External) 9/14 10:47 AM
if ratepayer funds facilitate any platform...this will be a big regulatory question

PM Paul De Martini (External) 9/14 10:48 AM
<https://userstcp.org/task/social-license-to-automate/>

RC Ron Cunningham (Guest) 9/14 10:49 AM
the TECM is not yet encoded in an ontology, or knowledge graph tool. That is on the potential next steps. The graphic was manually prepared, but is grounded on the concepts table of names, definitions and the relations between those concepts.

DF David Forfia (External) 9/14 10:52 AM
In a former life, after multiple call days in a row, customers simply disconnected the thermostats from the internet.

Regardless of what the lawyers say 😊

MK Knight, Mark R. (Guest) 9/14 10:54 AM
Odd things you remember: discussing fantasy football with Paul De Martini after a GWAC meeting in California many years ago when Paul said that you have to be able to explain things in words that an 8th grader can understand and explain to somebody else. It made an impact because one of my boys was in 8th grade at the time

KA Kay Aikin (Guest) 9/14 10:54 AM
Excactly David, consumers shouldn't have to resort to those actions if we design the system correctly.

Marc Costa explained the work he was referring to. He said that LBNL had led an effort to review relevant standards. It was similar to a dictionary or taxonomy. ASHRAE integrated some of it. Not sure how standards will vary state to state.

Steve noted that there are probably other parallels to this work.

Steve replied to Toby Considine that this effort is were more into more about the description and not about critiquing.

Kay Aikin said if we have to rely on ULAs and getting customers to approve then we haven't thought far enough. Instead, we need to build systems that put customers at the forefront. Customers should not have to give up rights to implement systems.

Ken Wacks asked if Steve would say they would have a common methodology for privacy? Such as what data is being gathered, and how it will be kept and disposed?

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Steve said they didn't get into the level to describe all of this. That wasn't their objective.

Ken suggested that the lawyers will then use language that only they understand.

Steve agreed and said his personal idea is to have machine readable agreements so that they system could configure itself. The terms then would be settled and would be capable of evolving.

Ken mentioned international gateway standards in development. The gateway can act as a filter.

Kay added that we are making a mistake if lawyers must write the language, it's not a good objective.

Ron B. said the privacy is at a level below the conceptual model. Privacy may be its own concept model.

Steve agreed that Privacy could be a concept on its own.

Action: Susie to work with Steve to get the talk out to the GWAC (done)

Conferences and Events

Date	Event	Location	Attend	Speak	Topic
Sept 19 - 22, 2022	RE+, Sept 21 – SEPA Working Group Forum (GAWG and TEWG)	Anaheim, CA	Ron Melton, Ron Cunningham, Farrokh Rahimi ?	Yes	GAWG Primer and Ontology overview
Oct 4 - 6, 2022	GWAC F2F	San Diego, CA	ALL	Yes	The Next Big Thing
Oct 4 - 6, 2022	UCA OpenFMB Plugfest	Charlotte, NC	No	No	
Jan 16 -19, 2023	IEEE ISGT	Washington, DC		Yes	
Jan 5 – 8, 2023	Consumer Technology Assoc.-CES 2023	Las Vegas, NV			Global Stage for Innovation
Feb 4 - 8, 2023	ASHRAE (Co-sponsor with IEEE) / AHR Expo	Atlanta, GA	Ron Bernstein, Farrokh Rahimi (tent)	Yes	Standardized Building Datasets for Benchmarking Control Algorithms, Energy Efficiency, Modeling, and Decarbonization, Possible GWAC F2F
Feb 7 – 8, 2023	GWAC Seminar and F2F (co-located at AHR Expo)	Atlanta, GA	All		GWAC Seminar. AHR has reserved a free meeting room for a F2F meeting.

Aaron Smallwood noted that RE+ is the largest energy trade show event in North America.

Ron Bernstein commented that for the AHR Expo in Atlanta in February, GWAC should hold a Face-to-Face meeting and also schedule a talk at the Expo by GWAC. AHR would provide GWAC with the meeting space needed.

David Forfia asked to add DistribuTech to the calendar for Feb. 7-9, 2023.

Action: Add DistribuTech to this list <https://www.distributech.com/welcome> (done)

Jaime Kolln, PNNL noted that he is planning to attend the RE+ conference.

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Actions

The F2F Organizing Committee: The committee members are Ron Melton, Ron Bernstein, David Forfia, Ron Cunningham, Farrokh Rahimi, Jaime Kolln and Marc Costa

August Actions:

Action: Kay and Susie to collaborate on the next blog post for Rahul Bahadur

✓ **Action: Possible speaker from SEPA on future blockchain and TE related initiatives (Sept)**

Action: GWAC attendees who have suggested topics or presenters for the F2F meeting, please let Ron M. and Ron B. know and copy Susie.

✓ **Action: Susie will get a copy of Lorenzo Kristov' talk today and have it posted to the GWAC website. (done)**

Ron Melton encouraged the group to send suggestions for future GWAC speakers to Ron Bernstein, himself, and Susie McGuire.



2022 Fall GWAC F2F – Rough Agenda

Theme: Future GWAC Efforts in Support of Deep Decarbonization

- **Day 1 - Afternoon**
 - GWAC Administrative
 - Set up discussion / activity / presentation(s) for Day 2: Overview of GWAC Past activities
 - Context Setting Interop Framework
 - GWAC Stack
 - TE Framework
 - Future States Work
 - Guest Speaker: PR100 Efforts – Dino Lelic, Quanta / LUMA
 - PM - Social Activity
- **Day 2 - Morning**
 - DOE Perspective(s) - Chris Irwin
 - DOE Programs Overview – Angela Becker-Dippmann, PNNL
 - Presentations on: What are the challenges for achieving deep decarbonization? – Mark Martinez & Anthony James, SCE
- **Day 2 - Afternoon**
 - Emerging Trends and Systemic Issues Review – Seemita Pal, PNNL
 - Interactive session - workshop of some kind: What can GWAC do to help address the challenges of deep decarbonization?
 - PM - Social Activity
- **Day 3 - Morning**
 - Discussion: How do the individual interests and activities of the GWAC members apply
 - Moving Forward: GWAC Action Planning
- **Day 3 - Afternoon**
 - Social Activity (Optional)

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Dino Lelic, Quanta Technology has confirmed that he will present on the PR100 resilience and transition effort at the October Face to Face meeting.

Angela Becker Dippmann, PNNL is making plans to present to the group on DOE Programs.

Chris Irwin, US DOE is planning give a presentation.

Ron Bernstein has invited both Mark Martinez and Anthony James from Southern California Edison to present at the F2F on Challenges to Deep Decarbonization. He added that the meeting will be scheduled as both in person and virtual. He noted that the headcount will be limited to 30 people.

PowerPoint Slide Show - [2022 SEP GWAC Meeting slides sm]

Project	Grid Arch for Regulators	Grid Architecture White Paper	TESC 2022 Conference	Grid Future States	GWAC Blog Content and Review Committee	THE NEXT BIG THING
Scope	Applying Grid Architecture in the Policy & Regulatory arenas	An introduction to Grid Architecture -- including best practices and real-world examples	Annual GWAC sponsored conference focused on Transactive Energy and related topics	Update Grid 3.0 Future States	Decarbonization, GA for Policy	Council's primary focus for the next year – results of F2F meeting.
Audience	Policy Makers	Geared to stakeholders who aren't familiar with grid architecture	Decision makers, solution providers, labs, academics, policy, solution providers	Industry Stakeholders	Industry stakeholders, public facing website	Council, Friends, All Stakeholders
Status	On hold until after TESC 2022	Collected inputs and comments from working party members	Complete	Material prepared and presented at TESC 2022	4 blogs released, 3 in queue	Concept phase
Actions	Group: Lorenzo Kristov, Larisa Dobriansky, Kay Aikin, Farrokh Rahimi, Chris Villarreal, Mark Paterson	Waiting for working party comments Finalize draft	Conference Closeout (final accounting, reporting in process RB)	Convert TESC 2022 presentation material into report sections	Group: Kay Aikin, Ahimahz Negash, Larisa Dobriansky, Ron Bernstein, Tonya Barham, Rahul Bahadur, Leonard Tillman, David Katz, Tim Schoechele, Heather Donaldson	Potential focus of seminar at AHR Expo in Atlanta in Feb. 23
Leadership	Lorenzo Kristov	Seemita Pal, PNNL	GWAC members on the OC	Ron Cunningham	Kay Aikin	Council

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Lorenzo Kristov will schedule a teleconference for his committee next week and they will plan to present at the F2F meeting. He scheduled the meeting for an early afternoon time so that Mark Paterson in Australia could attend.

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🕒 Grid Architecture White Paper – Updates from Seemita

- Seemita has made edits based on feedback and work group inputs
- Some graphics need polishing, she is working with PNNL Comms to make that happen
- A new section has been added
- Other changes from the work group are underway

Seemita Pal, PNNL reviewed progress on the Grid Architecture white paper; she expects it to be available soon for review by the GWAC.

Ron Cunningham said that the Grid Future States group will have a draft ready in time for the Face-to-Face meeting.

Kay Aikin is planning to schedule a meeting of the blog committee after the Face-to-Face meeting.

Ron B said we will discuss where to direct GWAC future efforts at next at the F2F and we can call it “the next big thing.” He asked the group to please come with ideas and discussion topics about what the GWAC should work on in the next couple years.

Ron B suggested that the GWAC Winter Face to Face be held in conjunction with the AHR Expo. The GWAC F2F could be held on Wed. Feb. 8 all day. AHR will provide a room for GWAC at no cost. Also, GWAC could present a 2-hour seminar on Tuesday, Feb. 7. He expects to have good attendance (over 100) at the seminar based on previous experience with GWAC at AHR.

Ron M noted that the previous GWAC seminar held in conjunction with the AHR Expo in 2019 gave the group good visibility.

Liaison Reports

NIST - David Wollman will report in October. No updates for today.

EPRI - Sean Crimmins – Sean is the manager of enterprise architecture and system engineering at EPRI. He is taking over for Gerald Gray as the GWAC EPRI Liaison point of contact.

Gerald Gray has moved to Extensible Energy.

Sean noted that EPRI will have an Advisory Session in Austin later this month followed by the CIM User group meeting. He will also attend a similar meeting in the Netherlands later this year.

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CABA/CTA - Ron Bernstein; Ron noted that Farrokh Rahimi will give a talk at the ASHRAE Winter Conference in Atlanta, Feb. 4 – 8, 2023.

Ron B announced a new report on specifications for building automation system that should go out for public review in time for the Winter meeting. There is some building to grid information in it. Ron will keep GWAC updated.

ISO/IEC - Ken Wacks – A new meeting series started September 13. They will meet on Zoom for 3 days a week this week, 4 next week and 2 days the last week of Sept and a plenary on Sept 30. Generally, 15 to 20 people attend each day with an international audience. Projects include customer-focused energy management.

IREC – Ken Wacks – Customer Grid Edge will meet this Friday and will feature a talk on energy activities in Canada. David Katz will be the featured speaker this Friday.

SEPA - Aaron Smallwood – Aaron noted that the RE+ meeting is next week. The trade show is sold out and attendance will in the range of 22K to 25K people. At the end of July an EV Charging publication that SEPA co-authored with NIST was published.

He also noted that the Grid Arch Primer paper was recently published by SEPA.

Aaron said that a new CEO for SEPA will be installed very soon, interviews are starting. Possibly to be announced late in Qtr 4 2022 or Qtr 1, 2023.

○ Liaison Reports

- NIST – David Wollman
- EPRI – Sean Crimmins
- IEEE PES – Farrokh Rahimi
- ASHRAE, CTA, CABA – Ron Bernstein
- ISO/IEC, IREC – Ken Wacks
- SEPA – Aaron Smallwood
- EBC – Tony Giroti
- NARUC – Chris Villarreal

- Are there other organizations we should be hearing from?
- Candidates: OpenADR, Green Button, eMerge, SunSpec, CEA

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Upcoming GWAC Meetings

Date	Topic or Speaker	Format	Other
September 14	Steve Widergren is invited to present on TE Conceptual Model from the SEPA TE working group	Web	May need to reschedule due to conflict with SEPA RE+ event
October 4 - 6	Future GWAC Efforts in Support of Deep Decarbonization	F2F	Hosted by GWAC Chair Ron Bernstein
November 16	TBD	Web	
December 14	TBD	Web	
February 7- 8	AHR Expo Seminar on F2F Meeting	F2F	Co-located at AHR Expo. Free conference room arranged

Ron Bernstein proposed that the group skip the January instance of the GWAC meeting since there will be two weeks of inactivity followed by the February Face to Face meeting on Feb. 8 during the AHR Expo.

Currently a GWAC meeting scheduled for Jan. 18, 2023.

Ron Melton gave the group a reminder that there will be a call for new members coming up. Ron M will be talking with those up for renewal to be sure that they want to continue on. Mid-Oct the call for candidates will go out.

Ron Bernstein adjourned the meeting and noted that the next GWAC meeting is the October Face to Face meeting in San Diego with a Virtual option for the administrative portion of the meeting and a full meeting virtual option for those who pre-registered.