

**Joseph William Hagerman**  
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*Summary:*

- *Solutions-driven and resourceful policy, building, energy, and controls expert with almost 20 years of research and senior leadership experience.*
- *Committed to strategic collaborations in building Operational Technologies (OT) cybersecurity, building energy conservation, clean energy and Distributed Energy Resources (DER) integration, and developing sustainable, competitive buildings and related technologies for the 21st century.*
- *Adept at developing and managing highly effective teams for evaluating and developing energy solutions, advancing grid solutions, and planning/operationalizing new initiatives.*
- *Experience in building world class research teams and proposals while growing and mentoring diverse professionals and communities of thought.*
- *Subject matter expert in advanced building systems/concepts, transactive energy systems, cybersecurity, and interoperability of diverse technologies.*
- *Served multiple technical roles as a consulting engineer and architect, capable of analyzing current energy and building regulations, legislation, and policies.*
- *Great willingness to learn, work with others, and promote professional development and inclusion.*

*I. Employment Experience:*

**2019 – current *Group Leader for Building Integration and Controls, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN***

- Leads, manages, and support's ORNL building-to-grid research staff (~12-15 PhD researchers) focused on advanced controls research for DoD, DOE, and other Federal funding sources related to buildings', facilities', and utilities' energy utilization
- Directly supports Office of Electricity's (OE) Transformer Resilience and Advance Technologies (TRAC) program as a subject matter expert and industry/research engagement specialist providing technical and strategic support to OE
- Leads ORNL's activities on smart homes, smart buildings, connected communities, and research that applies advanced Internet-of-Things (IoT) or OT control solutions to physical systems and infrastructures to generate data and insights
- Leads ORNL's building cybersecurity activities with coordination with other internal and external stakeholders (such as the Healthcare-Information Sharing and Analysis Center (H-ISAC))
- Contributes to ORNL's building data, machine learning, and artificial intelligence research that leverages user facility related data for insights, savings, and opportunity creation
- Serves as a subject matter expert to senior leadership and staff on utility perspectives, demand side management (DSM) opportunities, and secure controls

**2018 – 2019 *Deputy Chief Scientist, National Rural Electric Cooperative Association (NRECA), Arlington, VA***

- Leads, manages, and support's NRECA research staff (~8 PhD researchers and ~30 contractors) focused on...
  - o Advanced Analytics for DER integration primarily by leveraging NRECA's Open Modeling Framework (prepared and won ~\$4.5M in DoD and DOE funding in 2019)

- Cybersecurity throughout NRECA membership by developing practices, methods, and tools for (IT & OT) cybersecurity integration in small to medium sized utilities that are resource constrained
- Cybersecurity sensors that leverages deep packet analysis and grid analytics to study cyber-physical tie and impact between the two (managing NRECA's team(s) engaged in DoD DARPA's Rapid Attack Detection, Isolation and Characterization Systems (RADICS) program)
- Scaling Distributed Energy Resources (DER) across the NRECA cooperatives, particularly within rural communities with low to moderate incomes, through community solar, community wind, and leveraging municipal water systems as DER balancing resources (prepared and won ~\$6M in DOE funding in 2019)
- Develops new research offerings for NRECA members at the Distribution Level including...
  - Cybersecurity (particularly low-cost cybersecurity assessments and penetration testing)
  - Distributed controls (particularly solutions to harden MultiSpeak or to couple cybersecurity sensors to control solutions)
  - Transactive concepts (particularly in the development of transactive pricing node by leveraging Distribution cooperatives' readily available wholesale financial and technical data)
  - Big ideas such as leveraging electrochemical production of NH3 as a beneficial electrification and advanced DER (and to reduce foreign imports of NH3)
- Works to position NRECA and its members with federal clients and serves as the primary contact to DOE national labs and outside research related groups including...
  - American Public Power Association (APPA) which represents ~47M consumers
  - National Resources Development Council (NRDC) which partners with NRECA for beneficial electrification and decarbonization activities
  - Cooperative G&T and larger members to develop a common R&D plan and member supported entity similar to but distinct from the Electric Power Research Institute (EPRI)
- Works internal to NRECA to develop research related policies and strategies.

**2018**                    **Senior Program Manager, ICF, Jackson, MS**

- Manages statewide DSM program for Entergy Mississippi (while managing ~10 EE implementation staff and ~15 EE/HVAC performance contractors/businesses) including...
  - Low income lighting (primarily for MS low to moderate income households)
  - Appliance energy efficiency incentives
  - Whole house residential audits and prescriptive, lite upgrades
  - Commercial building efficiency (primarily focused on small business)
  - Industrial efficiency projects
- Develops new products and offerings for ICF clients in areas of Smart Homes/Neighborhoods
- Works to position ICF with federal clients and serves as the primary contact ICF has with DOE national labs and outside research groups

**2012 – 2017**        **Senior Policy Advisor, Energy Efficiency and Renewable Energy, US Department of Energy.**

- Designs and manages high priority research areas (i.e. "new research starts" including building to grid integration (~\$23M) including all DOE transactive energy/transactive controls/transactive controls platform development (Volttron)) and all DOE activities for behind-the-meter cybersecurity:
  - PROJECTS include VOLTTRON (Version 5 which is a cybersecure, distributed building control system), Clean Energy and Transactive, Connected Campus, Building Energy Storage Application Center, joint-Southern Company/DOE Smart Neighborhood, Residential Home

- Energy Management System (HEMS), Smart Distributed and Building Transformers, Connected Loads as a Resource, Cyber Secure Hybrid Inverters (for Photovoltaic (PV) and motors (as motor controllers)), and Connected Appliances and Devices.
  - FOUNDATIONAL including methods for Intelligent Load Control (ILC), “Virtual” Storage, Machine Learning, Resiliency, Capacity Bidding, and Economic Dispatch.
- Manages special regulatory activities through DOE’s Appliance Standards Regulatory Advisory Council (ASRAC) including Manufactured Housing Negotiated Rulemaking, Miscellaneous Refrigeration Products Negotiated Rulemaking, Circulator Pumps Negotiated Rulemaking and voluntary Characterizations of Connected Devices
- Developed, Oversees, and Mentors Building Innovators -- ~12 graduate students/post doctoral students per year, and two student start-ups focused on the building-energy sector:
  - One startup funded and mentored was Maalka ([www.Maalka.com](http://www.Maalka.com)), an open energy efficiency platform designed to help cities and building owners easily meet their commercial benchmarking goals
- Oversees, takes corrective actions, and supervises program areas that are misaligned to current administration priorities – within DOE, with National Labs (PNNL, ORNL), and with contractors
- Advises senior decision makers on the portfolio review of all RD expenditures for scientific, innovation, economic, and policy impacts

2011 – 2012 **Senior Associate**, Booz Allen Hamilton (BAH), Washington, DC.

- Works with Federal clients to assist in the development and impact analysis of public policies
- Works with commercial clients to develop portfolio analysis tools and resource to reduce enterprise energy usage and expenditures
- Works internally to better position BAH staff for engagements around energy efficiency especially in response to federal, state, and local law, ordinances, and regulations

2009 – 2011 **Senior Technical Advisor to the Assistant Secretary of Energy Efficiency and Renewable Energy**, US Department of Energy.

- Evaluated and developed national energy efficiency policies with the Assistant Secretary including policies launched by the White House (including HomeStar, 111D, Recovery through Retrofit, Better Buildings)
- Served various administration positions including Acting Program Manager of the Building Technology’s Program (6mos managing ~70 employees), Acting Research and Development Supervisor for Emerging Building Technologies (6mos), Acting Commercial Building Supervisor (6mos) while overseeing the reorganization and reprioritization of the Building Technology’s program including staffing, budgeting (approximately \$250MN annually), and execution
- Oversaw the re-structuring of EERE’s regulatory program (Appliance Standards Program) to expedite rule making and meet congressional mandates, executive orders, and other legislative deadlines while evaluating and leading policy analysis reviews
- Administered the execution and management of all Building Technology’s American Reinvestment and Recovery Act projects including the State Appliance Rebate Program and competitive solicitations (totally \$2.5BN)

2007 – 2009 **Design Consultant to the State of Mississippi’s Mississippi Emergency Management Agency**, Jackson, MS;

- Building Science and Design Consultant to the State of Mississippi’s \$280MN FEMA contract

- Managed architects, engineers, manufacturers, and science advisers (ORNL and the Florida Solar Energy Center (FSEC)) to the largest, most energy efficient modular and HUD-code contract every competitively bid to the industry
- Designed and built over 3,200 housing units (exceeding Energy Star performance levels) to replace FEMA travel trailers
- Placed into production the manufacturing of a common product design to an entire industry – thereby, turning individual companies into contract manufacturers for a specialized product

2006 – 2009 **Project Manager**, *The Federation of American Scientists, Washington, DC*;  
<http://www.fas.org>

- Building Technologies Project Manager reporting directly to the president and board members
- Oversaw all building related research, development, and demonstrations of advanced energy efficient techniques and technologies with support from The Department of Energy 's (DOE) Building America Program, The Charles Pankow Foundation for innovations in building design and construction, and other funding sources
- Managed approximately \$500,000+ research budget to work with University professors and trade associations to advance building technologies

2005 **Intern Architect**, *Steven Winter Associates, South Norwalk, CT*; <http://www.swinter.com>

- Researched and developed building products (for Dupont, Old Castle, etc.)
- Contract research and design demonstration projects (with HUD, PATH initiatives, etc.)
- Technical/proposal/grant writing (SBIR, DOE, HUD)

2003 – 2004 **Research Associate I**, *Joint appointment with the John C. Stennis Institute of Government and the College of Architecture, Mississippi State University*;  
<http://www.caad.msstate.edu/>

2001 – 2003 **Visiting Lecturer**, *College of Architecture, Mississippi State University*;  
<http://www.caad.msstate.edu/>

**Research Assistant**, *Carl Small Town Center (CSTC); Mississippi State University College of Architecture*; <http://carlsmalltowncenter.org/>

- Community design and development with not-for-profits (including HUD and Habitat for Humanity),
- Research on panelized construction (including Structural Insulated Panels (SIPS) and steel stud assemblies)
- Research on and developing cellular glass building products utilizing recycled glass

## II. Education:

2004 – 2006 **Columbia University, Fu Foundation School of Engineering and Applied Science: Civil Engineering and Engineering Mechanics**; Master of Science in Civil Engineering; Graduated Fall 2006; Teaching Assistant, Spring 2005; Research Assistant, Fall 2005, Spring 2006

1995 – 2001 **Mississippi State University, College of Architecture**; Bachelor of Architecture; Graduated Fall 2001 with honors

## III. Other Distinctions, Awards, Fellowships, etc:

- **2018 - 2019 Grid Wise Architecture Council (GWAC) Member Emeritus**
- **2016 Secretary Honor Award** – Awarded for work on Appliance Standards to meet the Climate Action Plan (CAP) goals.

- **2014 DOE Distinguished Service Award** – Awarded for work in 2014 on EERE’s grid integration initiatives.
- **2010 DOE Distinguished Service Award** – Awarded for work in 2010 on HomeStar Legislation and Regulatory Reform including new policies and policy positions to accelerate the adoption of energy efficiency.
- **Rafael Viñoly Fellow**, Rafael Viñoly Architects, NYC for 2005-2006; <http://www.rvapc.com>. Researching, developing, and demonstrating the next generation of green roofing technologies.
- **2005 Metropolis Next Generation Award** recipient for proposal entitled: Biopavers.
- **2005 Research Assistant**, Columbia University, NYC; “York County (PA) Waste-to-Energy Ash Beneficial Use Demonstration Project.” PI: Professor Christian Meyer. Investigating the use of municipal combustor ash in concrete products and technical ceramic applications.
- **MS-FAST Program Fall 2003 Award** recipient for proposal entitled: “Photovoltaic camouflage for military and commercial applications”
- **MS-FAST Program Spring 2002 Award** recipient for proposal entitled: “Thin film controllable thermal matrix (cooling and heating) and use for these devices in temperature reporting, visual displays, and other applications”
- **Director for Mississippi State University’s Design Discovery Program** (Summer 2002, Summer 2003)
- **Architectural Research Center Consortium Jonathan King Student Medal** for excellence in Architecture and Environmental Design Research, Spring 2000.
- **Mississippi State University College of Architecture 2000 Undergraduate Research Award**, Spring 2000.
- **Staub, Robison, Williams Excellence Award** (MSU College of Architecture third year architecture award, 1997-1998 semesters)

*V. Publications:*

- Buckberry, Burke, Hagerman, et al. “**Smart Technologies Enable Homes To Be Efficient And Interactive With The Grid.**” United States: N. p., 2020. Web. doi:10.2172/1615193.
- G. Hernandez, J. Hagerman. 2016. “**Supporting a Thriving Transaction-Based Controls Ecosystem: DOE’s role in creating a comprehensive controls program across DOE to support Buildings and Grid Modernization.**” Proceedings of the 2016 ACEEE Summer Study on Energy Efficiency in Buildings. Pacific Grove, CA. <http://aceee.org/files/proceedings/2016/data/index.htm>
- S. Katipamula, J. Haack, G. Hernandez, B. Akyol and J. Hagerman, “**VOLTRON: An Open-Source Software Platform of the Future,**” in IEEE Electrification Magazine, vol. 4, no. 4, pp. 15-22, Dec. 2016. (DOI: 10.1109/MELE.2016.2614178)
- Wang, Hagerman, et. al. “**Connected Building Challenge – Seattle Demonstration.**” United States: N. p., 2016. Web.
- Hagerman, Joe. “**Buildings-to-Grid Technical Opportunities: Introduction and Vision.**” United States: N. p., 2014. Web. doi:10.2172/1220813. <http://energy.gov/eere/buildings/downloads/buildings-grid-technical-opportunities-introduction-and-vision>
- Primary author of DOE issued Buildings to Grid reports (Federal Government issued reports without personal citation)
  - DOE EERE. July 2016. **The National Opportunity to Secure Buildings and Facilities from Emerging Cyber Threats.**
  - DOE EERE. September 2016. **Connected Equipment Maturity Model. V1.0.**

- DOE EERE. 2016. **The National Opportunity for Interoperability and its Benefits for a Reliable, Robust, and Future Grid Realized Through Buildings.**  
<http://energy.gov/eere/buildings/downloads/national-opportunity-interoperability-and-its-benefits-reliable-robust-and>
  - DOE EERE. 2015. **A Framework for Characterizing Connected Buildings Equipment.**  
<https://www.regulations.gov/document?D=EERE-2014-BT-NOA-0016-0047>
  - DOE EERE. 2014. **Buildings-to-Grid Technical Opportunities: *From the Buildings Perspective.*** <http://energy.gov/eere/buildings/downloads/buildings-grid-technical-opportunities-buildings-perspective>
  - DOE EERE. 2014. **Buildings-to-Grid Technical Opportunities: *From the Grid Perspective.***  
<http://energy.gov/eere/buildings/downloads/buildings-grid-technical-opportunities-grid-perspective>
  - DOE EERE. 2014. **Buildings-to-Grid Technical Opportunities: *From the Information and Communications Technology Perspective.***  
<http://energy.gov/eere/buildings/downloads/buildings-grid-technical-opportunities-information-and-communications>
- Funder and co-editor on many foundational DOE building and grid documents. Professionally, the following are those documents I believe are pivotal to transactive controls and expand “Reference Guide for a Transaction- Based Building Controls Framework” (2013)...
    - Akyol BA, JN Haack, BJ Carpenter, S Katipamula, RG Lutes, and G Hernandez. 2015. Transaction-Based Building Controls Framework, Volume 2: Platform Descriptive Model and Requirements. PNNL-24395, Pacific Northwest National Laboratory, Richland, WA.  
[http://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-24395.pdf](http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-24395.pdf)
    - Haack JN, S Katipamula, BA Akyol, and RG Lutes. 2013. VOLTTRON Lite: Integration Platform for the Transactional Network. PNNL-22935, Pacific Northwest National Laboratory, Richland, WA.  
[http://www.pnl.gov/main/publications/external/technical\\_reports/PNNL-22935.pdf](http://www.pnl.gov/main/publications/external/technical_reports/PNNL-22935.pdf)
    - Hammerstrom DJ, CD Corbin, N Fernandez, JS Homer, A Makhmalbaf, RG Pratt, A Somani, E Gilbert, S Chandler, and R Shandross. 2016. Valuation of Transactive Systems. PNNL-25323, Pacific Northwest National Laboratory, Richland, WA.  
[http://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-25323.pdf](http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-25323.pdf)
    - Hardin D, EG Stephan, W Wang, CD Corbin, and SE Widergren. 2015. Buildings Interoperability Landscape. PNNL-25124, Pacific Northwest National Laboratory, Richland, WA. [http://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-25124.pdf](http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-25124.pdf)
    - Katipamula S, RG Lutes, H Ngo, and RM Underhill. 2013. Transactional Network Platform: Applications. PNNL-22941, Pacific Northwest National Laboratory, Richland, WA.  
[http://www.pnl.gov/main/publications/external/technical\\_reports/PNNL-22941.pdf](http://www.pnl.gov/main/publications/external/technical_reports/PNNL-22941.pdf)
    - Somasundaram S, RG Pratt, BA Akyol, N Fernandez, NAF Foster, S Katipamula, ET Mayhorn, A Somani, AC Steckley, and ZT Taylor. 2014. Transaction-Based Building Controls Framework, Volume 1: Reference Guide. PNNL-23302, Pacific Northwest National Laboratory, Richland, WA.
  - Prior architectural research publications and presentations:
    - Co-authored: Khalid Mosalam, Joseph Hagerman, and Henry Kelly, “**Seismic Evaluation of Structural Insulated Panels.**” ASCE International Committee, LA; 5<sup>th</sup> International Engineering and Construction Conference, August 2008

- **“Cementitious Structural Insulated Panels for Multistory Construction”** presentation at the AEI 2008 - Building Integration Solutions, ASCE, Sept 2008
- **“FAS-Turkey Building Technology Collaboration”** presentation at the 2007 Forum Istanbul, Istanbul Turkey.
- Hagerman, Joe and Hodge, David. **“Optimizing the Building Envelope with Green Roofs: A Discussion of Architectural and Energy Performance Requirements.”** 2006 International Green Roof Symposium: “Greening Rooftops for Sustainable Communities.”
- Co-authored: Crosby, et al. **“Integrating Panels into the Production Homebuilding Process.”** Submitted September 2005 for HUD’s PATH Initiative on Advanced Panelized Construction. <http://www.huduser.org/>
- Gore, N., and J. Hagerman. 2000. **“Shallowing the Learning Curve: Making GIS Easy Enough for Even an Architect to Understand.”** Conference Proceedings. Proceedings from the Environmental Systems Research Inc. (ESRI) Users Conference.

*VI. Research Interests:*

- Building Sensors and Controls – including transaction-based controls, distributed control methods, low cost sensors for advanced control algorithms;
- Building and Building-to-grid Cybersecurity – including developing methods for advanced detection, mitigation, and re-start through the monitoring of operational technologies communication and network traffic observation;
- Development and Application of Traditional and “Green” Building Technologies/Products;
- Energy Efficient and Advance Building Techniques and systems particularly:
  - Sandwich Panel Construction (SIPs) and Composite Building Panels;
  - Heat pumps (especially mini-split heat pumps including ductless and ducted options);
- Mechanics of Cellular Solids and Foams; and,
- Engineering Mechanics and Mechanics of Materials.