



Session Speakers & Descriptions

Note: The information below is subject to change.

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WEDNESDAY, APRIL 1

9:45-11:00 am, Ellsworth Room

A Net Zero Retrofit Idea Exchange: From Scientific Inception to Construction

Speakers

[Roger E. Frechette III](#), Managing Principal, Interface Engineering

[Yolanda Cole](#), Principal, Hickok Cole

[Janice Lachance](#), Executive Vice President, Strategic Leadership and Global Outreach, American Geophysical Union

Description

In 2015, the American Geophysical Union (AGU) identified the need for a major headquarters renovation. The building's mechanical and electrical systems had reached the end of their useful life. Beyond creating a modern work environment and meeting place, AGU believed the project provided a unique opportunity to communicate its message of scientific advancement, reduce the facility's environmental impact, improve the health and well-being of employees in the work space and serve as a catalyst for future urban renovations.

To meet AGU's ambitious net-zero energy goal, the team embarked on a scientific approach to analyze more than 50 potential design strategies that impact energy usage, some of which were new to the U.S., or had not been applied to an urban retrofit. The team produced whitepapers that explored the benefits of different energy reduction, reclamation, absorption and generation methodologies, then analyzed potential efficiency versus cost in order to select the approaches most appropriate for the site. The selected design features reduced the building's energy use intensity to 'less than zero,' while enhancing the overall architectural character and functionality of the space. A thoughtfully designed PV array, connecting collaboration stairways and a ground floor exhibit space all help to promote sustainable

education and showcase the innovations that drive this transformative building. Some of the more unusual systems include a DC power distribution to workstations, a radiant exchange system providing thermal comfort to occupants, reclaimed storm water for toilet flushing, a hydroponic system to enhance indoor air quality and a geo-extract system using the municipal sewer to both heat and cool the building.

As a model for a new workplace, AGU's CEO led the way by championing an open workplace, populated with "quiet cars" and a variety of spaces where people can work on their own or with colleagues. The design team created a theme based on Earth and Space sciences, highlighted throughout the building with graphic design features and color palettes. A connecting stair, surrounded by active work spaces, was cut into the structure to bring AGU's staff together and to encourage healthy habits.

AGU also provided a model approach for working with public agencies and neighborhood groups. Located in an historic district, the project required an 18-month approval process. Because AGU engaged stakeholders in the process, the final design received unanimous endorsements from the organizations and individuals most impacted by the building's construction. The last unique aspect of the AGU renovation includes using multimedia displays and other visual methods to communicate the building's energy utilization. In this way, the building serves as a living teaching center for visitors as well as AGU's worldwide membership.

9:45-11:00 am, Spring Room

A Map to Existing Building Efficiency (Using ASHRAE Standard 100)

Speakers

[Chris Pendley](#), Senior Energy Engineer, Boland

[Mike Cain](#), Managing Director, ERA Building Solutions, LLC

[Chris Brehm](#), Service Provider Team Manager, ICF

Description

This session discusses the upcoming challenges facing building owners, managers, tenants, & advisors who are looking to develop a process to identify, quantify, and implement energy conservation measures in their buildings and portfolios. To that end, ASHRAE developed Standard 100 to help give these individuals both the basic targets to set and the process to follow to achieve them. Unlike many codes and standards, Standard 100 covers not only commercial buildings but also residential and mixed-use properties, frequently an overlooked source of emissions, energy consumption, and expenses.

The session will focus on practical application for real-world buildings (covering high-level strategies and specific local case studies) including:

- Funding Initial Assessments
- Setting Energy Performance Targets
- Creating a Short- and Long-Term Building Efficiency Strategies
- Funding Operational & Capital Improvements, including:

- Funding sources such as state and utility incentives and low-cost or strategic financing vehicles through entities such as the
- Montgomery County Green Bank and Montgomery County C-PACE
- Reviewing strategies for combining these mechanisms to defray initial capital expenses and ensure investments create reliable value streams to create continuous improvement opportunities.
- Measuring the Efficacy of Implemented Projects
- Maintaining Improved Building Performance Over Time

Montgomery County's diverse groups of owners, managers, tenants, consultants, and contractors are all becoming increasingly more aware of and engaged in the County's "Drive to Zero". Our existing building inventory is some of the most critical infrastructure needing to be addressed in this drive, and ASHRAE Standard 100 is precisely the map needed to get us on the path to zero.

9:45-11:00 am, Fenton Room

Impact of HVAC Systems on the Path to Zero

Speakers

[Chet Knaup](#), General Manager, Spectrum Energy
[Tim Dorman](#), Sales Engineer, Havtech
[Paul Elias](#), Executive VP of Construction, Redbrick LMD
[Bryan Niles](#), Davis Construction, Preconstruction Manager
[James Hansen](#), Mechanical Engineer, GHT

Description

Heating and air conditioning consume approximately 50% of the building's energy and offer the greatest opportunity to reduce the overall building energy usage. This discussion panel will focus on HVAC systems and the impact of building construction on system performance and cost. We will discuss the technology advancements over the past five years, primarily, reducing HVAC loads, the amount of energy needed and improving energy transfer methods. We will show how taking advantage of these advancements will greatly impact the cost and feasibility of achieving net zero construction.

The main obstacle in constructing Net Zero buildings is cost both real and perceived. There is a lingering perception that Net Zero buildings are cost prohibitive. Fortunately, the growth in popularity for Net Zero buildings has demonstrated that cost effectiveness is a realistic goal. To accelerate energy efficiency across our country, Federal, State and Local governments have developed policies and incentive programs to reduce market barriers. Montgomery County has taken a progressive approach in this market and along with the EmPOWER Maryland Program and other available resources, can mitigate first cost risk for Net Zero building developers.

There are many different strategies for designing Net Zero buildings but there are a few critical common threads for successful projects. Achieving a Net Zero building benefits greatly from creating an experienced team early on to analyze different strategies and construction practices. The design team, along with the general contractor, sub-contractors, energy consultant and the equipment manufacturer

must be part of this team to achieve best practices. Working in silos prevents the ability to fully understand the impact of each individual discipline will have on the building. To achieve holistic building performance communication is critical. Making design and construction decisions as a team reduces misunderstanding during construction and ensures that individual expertise is effectively utilized. This level of communication and collaboration is critical to leveraging integrated design principles and implementing cost control strategies.

The most cost-effective steps toward reducing a building's energy consumption usually occur during the design process. Integrated design results in design and construction solutions that cost less and perform better. Energy efficiency should be integrated early with architectural and programmatic decisions. All decisions will have an energy impact as well as a cost impact and balancing these is key.

Early design efforts using Energy Modeling and LCCA analysis enable teams to capture cost, including incentives to determine simple payback and total cost of ownership. Energy modeling enables endless iterations at the lowest upfront cost possible and provide early insight into the challenges of a Net Zero Building.

9:45-11:00 am, Great Hall

Sustain to Maintain: Montgomery County's Path to a Sustainable Future

Speakers

[Chris Weatherly](#), Energy Program Manager, Montgomery County

[Elizabeth Hitchman](#), Senior Program Manager, Pepco Energy Savings for Business Program

[Sandy Barrier](#), Account Executive, Pepco Energy Savings for Business Program

Description

Since EmPOWER Maryland programs launched in 2009, they have achieved considerable success through partnerships with Maryland utilities. To support EmPOWER Maryland goals, Pepco has been a leader in developing and promoting an innovative suite of programs and tools to encourage its customers to implement energy-efficient projects at their facilities. As studies have demonstrated, energy efficiency in Maryland has extraordinary benefits for both residents and businesses and is critical for state and local jurisdictions to meet their long-term environmental and sustainability goals. The Pepco Energy Savings for Business Program, targeting commercial and industrial customers, has led the way in promoting energy efficiency by providing financial incentives, financing, and design support that enable organizations of all sizes to save energy.

In this panel discussion, representatives from Pepco and Montgomery County will discuss how they partnered to create a more sustainable community. In the past three years alone, Montgomery County has completed nearly 90 projects, saving over 18.9 million kWh annually with the help of the Pepco Energy Savings for Business Program. Moreover, it reduced its utility expenses by over \$2 million per year and secured over \$2.8 million in Pepco incentives to implement projects. As the county brings numerous recent projects to a close, it continues to plan for a new phase of opportunities through participation in Pepco's Energy Efficient Communities Program. This includes the launch of a new round of Monitoring-Based Commissioning projects at county-owned and operated facilities. Come learn how

EmPOWER Maryland benefits communities, how the Pepco Energy Savings for Business Program helps local governments and businesses meet sustainability goals, what the non-energy benefits of energy efficiency are, and how your organization can participate in these programs.

11:30 am-12:30 pm, Ellsworth Room

The Foundation of Net Zero Design: What Architects Need to Know

Speakers

[Smita Thomas](#), Founder & Principal, Energy Shrink, LLC

[Robyn Toth](#), Principal, TCA Architects

[Kara Strong](#), Project Director, Sustainable Design Consulting

Description

So much has changed in the region in the last two years, when one of us presented on the Paths to Net Zero building at the Montgomery Energy Summit, then, a relatively new topic that generated much interest. Today we have several Net Zero buildings in the region, and a community mobilized towards getting more on board. The conversation has shifted from Why, and Can-we-even... to How.

When asked about engaging a consultant for energy efficiency, a common response from architects is, “Oh, we don’t work on energy efficiency. You should really be talking to the mechanical engineers.”

No. We want to talk to YOU, architects! Now is the time to realize the enormous potential for energy efficiency in architectural design and retrofits. The pioneering net-zero-energy United Therapeutics’ Unisphere project in Montgomery County represents but one approach to achieving net zero energy. We will discuss other approaches and resources available to help teams determine their own project’s optimal path. Where to find guides to determine zero energy performance targets, determine the solar potential on a site, or financing assistance will be discussed in reference to the local DMV region.

Architects, and developers who hire them, will learn how to deploy fundamental building science strategies to design buildings for optimal performance before involving the MEP firms, and play a central role in envisioning and driving the entire project team towards net zero. They will also hear stories from the field, including surprises, challenges and trade-offs that must be made in the pursuit of net zero. With approaches, resources, design concepts, strategies, energy modeling results, physical models, and real-world data and experience, our session will empower you to join the regional net zero movement.

The presenters have worked on modeling and designing some of the most advanced buildings in the region. Kara Strong is a Project Director at Sustainable Design Consulting. Drawing from her years of experience in architectural practice, Kara leads teams in the development of green educational facilities, institutional office buildings, and residential developments. She actively participates in the local Net Zero Energy Coalition and is coordinating the effort to organize critical net zero energy tools into one location. Smita Chandra Thomas, LEED AP, CPHC, and the founder and principal at Energy Shrink, studied with the passive design gurus of the 70s for her Master’s in Building Science at the University of California in LA and Berkeley in the 90s. Her career has been focused on energy efficiency and decarbonization in the buildings sector, both nationally and internationally. Smita will share practical

applications of building science in design. Robyn Toth is the Owner of TCA Architects in Maryland. She has been interested in sustainable design ever since she was a student of William McDonough at the University of Virginia. She led the design team for the Maryland's first net-zero school, Wilde Lake Middle School, which is nationally recognized for its outstanding energy performance. With over 20 years' experience, she will share lessons learned from years of pursuing high performance design.

11:30 am-12:30 pm, Spring Room

A Path to Zero: Are We Regionally Codified?

Speakers

[Bala Srini](#), Principal, Above Green

[Chris DeJulis](#), Chief Operating Officer, Above Green

[Bryan Bomer](#), Manager, Green Buildings, Montgomery County Department of Permitting Services

Description

Around the country increasing number of cities, jurisdictions, counties and states are gearing towards better efficiency and creating framework for greenhouse gas emissions reduction goals. Building codes, policies, programs and energy codes are playing an important role in changing the zero-energy building landscape.

This presentation will focus our region, the tri-state of DC, VA and MD on our current status and the plans for future. We will evaluate how far are current codes from net zero. This presentation will start with some historical data, definitions, codes and standards. A brief overview of leading energy goals, policies and energy stretch codes from other states and jurisdictions. We will focus on Zero Energy Construction Code, Zero Energy Outcome Policy and Zero Carbon Code or Policy.

As this is part of Montgomery County Energy summit, we will present the building and energy code status of the county, cities within county, future possible updates and how close for a net-zero reality.

This presentation will cover the net-zero policy and plans in the tri-state region towards net-zero waste and net-zero water. Sample projects in the tri-state region that has been successfully operating at net-zero and how they were or weren't impacted by the code, policies and programs.

11:30 am-12:30 pm, Fenton Room

High Performance Buildings: Where Energy and Indoor Environmental Quality Meet

Speakers

[Rich Silverman](#), Director, North America Operations-Building Services, UL

[Thomas Bowles](#), National Radon Team Leader, U.S. Environmental Protection Agency

[Joe Dilenno](#), Associate Principal/Senior Mechanical Engineer, Interface Engineering

Description

The movement toward net zero buildings is designed to advance sustainability and curb carbon emissions. However, reduced energy use may potentially come at the expense of other critical sustainability attributes such as good indoor environmental quality (IEQ), which supports occupant health and wellness.

In this discussion, panelists including EPA's specialist for the Indoor AirPLUS residential program, lead mechanical engineer for the NZE American Geophysical Union for Interface Engineering, and seasoned veteran of building performance director of operations for UL - Healthy Buildings, will discuss the optimal balance between IEQ and net zero performance. We'll explore how teams seeking net zero energy performance for their buildings can also prioritize IEQ to ensure the health and wellness of building occupants. We'll consider the importance of good IEQ and examine potential baselines for acceptable indoor air quality. We'll also evaluate the importance of net zero buildings and why they are growing in popularity. Finally, we'll consider the aspects of net zero building that have the potential to compromise IEQ and vice versa, including ventilation, building envelope and building materials selected.

After laying the foundation, we'll invite the audience to pose questions to the panel, or if necessary, pose our own as devil's advocate. Panelists will be asked to consider on one hand, complete commitment to net zero performance and, on the other hand, complete prioritization of IEQ. As a group, we'll discuss where on the spectrum building teams may land in order to achieve a balance between these objectives. The session will conclude with some actual case studies and how design teams, architects, construction professionals and buildings owners and managers worked to make reasonable trade-offs between two potentially conflicting sustainability objectives. Join us as we wade into the complexities that you face every day in the pursuit of greater sustainability. This is an hour well-spent to consider different perspectives and generate creative solutions.

11:30 am-12:30 pm, Great Hall

Getting to Net Zero Energy Buildings – A 12-Step Program

Speakers

[Robert Winstead](#), Principal | K12 Studio Leader, VMDO Architects

[Wyck Knox](#), Principal, VMDO Architects

[Brian Turner](#), Zero Energy Engineer, CMTA Engineers

Description

The first step toward making a change is admitting that you have a problem. The net-zero energy revolution is happening in the DC Metro region. The 2018 DC Clean Energy Omnibus Act identified the DC region as the nation's preeminent leader in clean energy and climate action. Achieving the goal of 100% renewable energy by 2032 will require a rapid transformation of the built environment – in the district and beyond. We have a long way to go in a relatively short period of time.

Net-zero energy buildings are believable, achievable, and necessary. Based on experience from more than a dozen net-zero energy targets, presenters will share 12 critical steps, in the order they should be

considered in the design and construction process, that will increase your chances of delivering a net-zero energy project that meets the clients aspirational goals and delivers significant long-term operational savings – without busting the construction budget.

The steps can be applied to projects of any size and type, and each of the steps will be supported through regional buildings that have achieved net-zero energy goals. Presenters will share lessons learned from previous projects, along with rules of thumb and specific strategies that have delivered measured results.

1:45-2:45 pm, Ellsworth Room

Introduction to Microgrids: What Does It Take from Concept to Implementation?

Speaker

Itamar Lopes, Technical Practice Leader, AECOM

Description

Our electric power industry is changing. The traditional centralized and unidirectional energy generation system is moving towards a more decentralized and complex approach where Microgrids play a major role. Microgrid is an integrated energy system of distributed energy resources and multiple electrical loads operating as a single, autonomous grid either in parallel to or “islanded” from an existing grid. The ongoing grid transformation does not only require a change on the grid infrastructure, but also the accomplishment of the so-called grid “3D challenge” (Decarbonization, Democratization and Decentralization) to fulfill the new requirements from a new sustainable society. Microgrids became a key element in this transformation addressing most of the obstacles imposed by the “3D Challenge” by promoting grid resilience, autonomy, stability, flexibility, efficiency and integration of renewables.

Understanding the benefits and challenges from a conceptual idea to a project implementation helps set the right expectations, avoid and mitigate risks, and measure and evaluate the correct efforts needed for a successful project deployment.

1:45-2:45 pm, Spring Room

Reducing the Environmental Impacts of Building Products and Materials

Speakers

[Torsten Biernat](#), VP, Director of Sustainability, Baumann Consulting

[Jochen Schaefer](#), SVP, Director of Business Development

[Lauren Asplen](#), Director, Healthy Sustainability Program, BlueGreen Alliance Foundation

Description

Session description is forthcoming. Please check back!

1:45-2:45 pm, Fenton Room

Getting the Most from Urban Geothermal Heating and Cooling Systems

Speaker

[Scott Emery](#), Senior Vice President, Office Director, Baumann Consulting

Description

Geothermal heating and cooling (geoexchange) is the most efficient heating and cooling option available for the built environment. Because of this and the emerging demand for net-zero energy buildings, geoexchange is being implemented more frequently and in more innovative ways including in commercial buildings in urban settings. This trend calls for a new look at how quality of geothermal installations is maintained.

The key feature of geoexchange systems is the ground coupled heat exchanger (or ground loop) which exchanges thermal energy between the building and the earth. Projects in high density, urban areas have limited space to install ground loops and are turning to installing them beneath the buildings they serve. In addition to the coordination issues presented by placing ground loops beneath buildings, net zero energy buildings have tight energy budgets that require every watt-minute be accounted for. Simply put, the installed ground loops must perform at or beyond the level they are designed for. As a result, urban geoexchange projects demand a level of precision, accuracy, and quality beyond that required for similar projects in suburban or rural locations.

In this presentation, the basics of geoexchange are presented; the nuances of installing ground loops in an urban environment are explained; areas of focus for construction phase quality and inspection programs are identified; and examples from Montgomery County projects illustrating the benefits of geoexchange inspections are shared.

1:45-2:45 pm, Great Hall

Getting to Zero: Learn How DMV Schools are Paving the Way

Speakers

[Brooke Holleman](#), Science, Technology, and Policy Fellow, U.S. Department of the Environment

[Maurice Gaskins](#), Senior Project Manager, Baltimore City Public Schools

[Andrea Swiatocha](#), Deputy Chief of Facilities, District of Columbia Public Schools

[Sean O'Donnell](#), Principal, Perkins Eastman

Description

Zero energy schools generate as much energy as they consume on an annual basis often with on-site solar photovoltaics (PV). As hurdles to achieving zero energy status are better understood, zero energy schools continue to grow in number. Focusing on greater energy efficiency first through design, construction, and operation benefits zero energy building owners, occupants, and communities by reducing energy consumption, improving health and comfort, and fostering robust learning environments. On average, zero energy schools can use between 65-80% less energy than

conventionally constructed schools, reducing the amount schools spend on energy bills, often the second highest expense after teachers' salaries.

The U.S. Department of Energy's Better Buildings Challenge partners with K-12 schools across the country who are demonstrating leadership in energy efficiency to develop resources and replicable models for success. As part of Better Buildings, the Zero Energy Schools Accelerator aims to make zero energy K-12 schools mainstream, while enhancing the educational environment for our nation's students. Through the unique experiences of local school districts, including Arlington County Public Schools and Alexandria City Public Schools, session attendees will hear directly from local districts who are pursuing zero energy construction and from those who have successfully completed zero energy projects. Attendees will also learn more about available DOE tools and resources to pursuing zero energy design.

THURSDAY, APRIL 2

10:00-11:00 am, Ellsworth Room

Demystifying Electric Vehicle Infrastructure in the Multi-Unit Dwelling Sector

Speakers

[Joyce Breiner](#), Executive Director, Poolesville Green, Inc.

[Karen Lefkowitz](#), CEO, Sunset Energy

[Joseph Sigwarth](#), Business Development Associate, LVL2 Charging

[Lynn Parsons](#), Program and Ops System Manager, World Wildlife Fund

Description

As electric vehicle (EV) adoption gains acceptance, the lack of EV charging infrastructure in the Multi-Unit Dwelling (MuD) sector, including townhome neighborhoods, has become the primary limiting factor in the purchase decision for those residents. With transportation being the largest contributor to regional greenhouse gas emissions, it is established understanding that the transportation sector must be electrified. This includes privately owned vehicles. As we look to the future, many residents will find vehicle ownership unnecessary, however there are those who will require a vehicle for various reasons. The average EV owner does 80% or more of EV charging at home. This represents a paradigm shift away from the antiquated and historically based petroleum idea of having to stop at a fueling station. While single family homeowners typically have the ability to install EV charging infrastructure at home, the same cannot be said for those condominium, apartment and townhome dwellers who will continue to require access to their own vehicle. MuD owners face unique considerations when installing charging stations, ranging from parking and electrical service access to billing and legal concerns. While many of these concerns can be addressed more easily in new project development, challenges persist for residents in existing MuD housing stock. Barriers to installation of EV charging infrastructure in this sector include lack of local code guidance, concerns from Home Owner Association boards and property managers, questions about the "who and how" of installations, maintenance and power billing and more. In order for EV adoption to thrive, these answers must be found and made readily accessible instead of advocated for on a case by case basis by individual residents with limited success.

10:00-11:00 am, Spring Room

The Risks of Net Zero Energy

Speakers

[James Ball](#), Vice President of Business Development, MaGrann Associates

[Jon Jensen](#), Director of Sustainability, MaGrann Associates

[Doug McCleery](#), Vice President Technical Services, MaGrann Associates

Description

Achieving net zero energy requires a significant reduction of the heating and cooling load in buildings. This improvement to energy efficiency has significant implications for how comfort and durability are achieved. For example very small heating and cooling equipment does not typically provide sufficient air flow for comfort and the ventilation system therefor becomes increasingly critical to air flow. Additionally air tight envelopes raise concerns of moisture management. This session will cover the risks and precautions needed to successfully achieve net zero energy. It will use Passive House as a proven standard for how to mitigate this risk. Focusing on the why and how behind Passive House metrics participants will gain a deep appreciation for the building science and non-energy benefit of the passive house approach.

Additionally, the presentation will discuss the unique project management and delivery methods utilized to increase collaboration and to ensure accomplishment of the design intent. This includes extensive mock-ups of the office construction, curtainwall system and the automation system, where all building control systems were networked and tested in a replica of the building's final network environment. The team will share our stories to help inform the next generation of zero-net energy projects.

10:00-11:00 am, Fenton Room

Residential Energy Efficiency Financing Solutions

Speakers

[Tom Deyo](#), CEO, Montgomery County Green Bank

[Dollie Banks](#), Senior Program Manager, Pepco

[Wyatt Shiflett](#), Director of Financing Programs, Maryland Clean Energy Center

[Casey Murphy](#), Vice President of Quality Systems, PEARL

Description

In this panel discussion, representatives from Pepco and Montgomery County will discuss how they partnered to create a more sustainable community. In the past three years alone, Montgomery County has completed nearly 90 projects, saving over 18.9 million kWh annually with the help of the Pepco Energy Savings for Business Program. Moreover, it reduced its utility expenses by over \$2 million per year and secured over \$2.8 million in Pepco incentives to implement projects. As the county brings numerous recent projects to a close, it continues to plan for a new phase of opportunities through participation in Pepco's Energy Efficient Communities Program. This includes the launch of a new round

of Monitoring-Based Commissioning projects at county-owned and operated facilities. Come learn how EmPOWER Maryland benefits communities, how the Pepco Energy Savings for Business Program helps local governments and businesses meet sustainability goals, what the non-energy benefits of energy efficiency are, and how your organization can participate in these programs.

11:10 am-12: 10 pm, Ellsworth

Changing Homes, Changing Minds: Rockville Residents Get on Board with Energy Efficiency

Speakers

[Heather Spiller](#), Senior Project Manager JLL

[Jeffrey Salay](#), Senior Principal, GHT Limited

[Ilona Johnson](#), Associate, GHT Limited

[Frances-Marie Puente](#), General Manager, Americana Condominium, Inc.

Description

The Americana Centre Condominium, located at 118 Monroe Street in Rockville Maryland needed mechanical system upgrades – with a proactive project management firm, a dedicated architect, an innovative MEP engineer and an engaged board of residents, the team devised solutions which meet the needs of all residents.

The presentation would be hosted in a panel format, with representatives from JLL (the project manager), DNC Architects (the lead architect), GHT Limited (the mechanical consulting engineer) and the Owner (TBD – tentative; board representatives from the Americana Centre Homeowners Association). This multi-perspective panel will present the challenges and opportunities associated with the project's design, the solutions considered, and the plan for implementing phased improvements to the Montgomery County property.

The project, which includes 425 condominium units in high-rise buildings, 124 units in 21 garden-style apartment buildings and 10 townhomes, was in dire need of mechanical upgrades. Originally constructed in 1972, the anticipated scope included:

1. HVAC Piping Replacement (High-Rise)
2. HVAC Piping Replacement (Garden Units)
3. HVAC Piping Replacement (Garage)
4. Underground Piping Replacement
5. Kitchen Piping Replacement (High-Rise)
6. Boiler Replacement
7. Chiller Replacement
8. Domestic Hot Water Heater Replacement
9. City Water Booster Pump Replacement
10. Ozone Water Treatment & Installation of Chemical Treatment System

This panel will also walk the audience through the investigation and study process, address resident engagement strategies and explain the solutions used to keep this 1970's building asset functional and efficient.

11:10 am-12:10 pm, Spring Room

Designing a Home for the Future Energy Grid

Speakers

[Craig Burton](#), Associate Principal, Interface Engineering

[David Peabody](#), Principal, Peabody Architects

[Matthew S. Fine](#), Principal, Peabody Architects

Description

What will the future energy grid look like in the United States? The presentation will address how policy, technology and wider climate impacts are moving our utility system from a central generation, transmission and distribution system to a distributed grid.

The team will define the roles that microgrids are having on larger energy infrastructure and in the design and consideration of individual homes. The basic components of a microgrid will be explained, along with the various archetypes that are coming to market for different scales and applications. The rationale for how distributed microgrids may interact and support one another will be explained, as well as how transactional energy and blockchain will support these grid interactions.

A deeper investigation into the use of Direct Current power, as the ""currency"" of the microgrid will be explained, along with the potential benefits, challenges and efficiencies that this type of electrical distribution may have on our building stock. The role of a building in the interaction with these distributed grids will be examined in detail.

The presentation will then draw attention to the opportunities for highly passive building design that are becoming more readily available, including use of Passive House methodology and specifications, solar and storage technologies and easily adaptable electrical systems that provide the platform for smart home automation and grid interactions.

The team will draw upon recent project experience with the design and construction of a net zero energy home in Arlington, Virginia and will explain the design process that went into the: Envelope design, Mechanical system design, Electrical microgrid, and Adaptability to future dc neighborhood microgrid. The team will also reference other larger scale projects previously built and in design to demonstrate how these holistic design approaches are having significant impact on our energy grid, homes and workplaces.

11:10 am-12:10 pm, Fenton Room

Developing Community Solar in Montgomery County: A Paddington Square Apartments Case Study

Speakers

[David Wright](#), Director of Project Development, Groundswell

[Emily Robichaux](#), Senior Director of Finance and Product Development, Groundswell

Description

The Paddington Square Apartments is a 165-unit, mixed-income multifamily rental property community solar project owned by the Montgomery County Housing Opportunities Commission (HOC) and located in Silver Spring, MD. Groundswell, in partnership with the HOC, the Montgomery County Green Bank, and SunLight General Capital, is developing a 273-kWdc community solar project at the property.

Construction is anticipated to begin in spring 2020, and the project will be operational later this year.

Project Development: This project will participate in the “low- to moderate- income” (LMI) category of Pepco’s community solar program under Maryland’s statewide community solar pilot initiative. Per the Maryland regulations for community solar systems (COMAR 20.62), LMI projects must provide a minimum of 30% of electricity output (kWh) to LMI subscribers, of which low-income subscribers must receive a minimum of 10%.

The solar array will be located on the rooftops of 11 existing buildings on the premises. The project is currently in the permitting phase. Construction is expected to begin in spring 2020. The Paddington Square Apartments are situated alongside an electricity feeder line that originates in the District of Columbia, making the project eligible for robust incentives via DC’s solar market.

Subscriber Model: Market rate households pay an affordable monthly subscription fee to access locally generated clean energy. Solar production savings are aggregated and allocated 100% to Empowered households (income-qualifying LMI households), who receive no cost subscriptions that reduce their electricity costs by approximately 50% each month for the 20-year lifetime of the project.

This project is projected to serve 91 households overall. Of those, 28 will be Empowered customers (including 10 households currently residing at Paddington Square). Each subscribing household is projected to save over \$500 on their electricity bills each year.

Project Team:

- Groundswell: Project developer and subscriber management organization. Groundswell is focused on empowering communities through equitable solar projects and has more than 57 MW of projects in development in Washington, DC; Maryland; Georgia; and Illinois.
- Montgomery County HOC: Property owner and manager. HOC provide affordable housing and supportive services that enhance the lives of LMI families and individuals throughout Montgomery County.
- Montgomery County Green Bank: Project financing partner. MCGB is a publicly chartered nonprofit corporation dedicated to accelerating affordable energy efficiency and clean energy investment in Montgomery County.
- SunLight General Capital: Providing equity investment for construction financing and long-term project operation. SunLight General Capital develops, finances, owns, and operates solar energy projects with a focus on the Northeast, helping to promote access to clean, affordable renewable energy.

1:15-2:15 pm, Ellsworth Room

Passive House Pitfalls: Case Study in Multi-Family Affordable Housing in West Philadelphia

Speakers

[Michael Pavelsky](#), Sustainability Director, The Sheward Partnership

[Jon Chizacky](#), Architect, The Sheward Partnership

Description

Dramatic energy use reduction through high-performance envelope design is a critical component towards achieving carbon neutrality. Combined with an efficiently-designed mechanical system, these are the guiding principles of Passive House construction. Beyond up to a 90% reduction in energy use, passive building strategies also provide resiliency and outstanding indoor air quality and comfort. The path towards passive, however, is not always easy. This is a story of failure, adaptation, and redemption.

The setting is West Philadelphia, an urban area characterized by dense row homes and troubled by vacant lots and abandoned structures. A local developer of affordable residential properties, previously familiar with LEED and ENERGY STAR certification, decided to choose two existing structures to experiment with Passive House certification. Through a series of obstacles, design decisions, and one truly challenging building orientation, the goals of this endeavor were not achieved. Nevertheless, the team learned many valuable lessons, from air-sealing practices to informative energy modeling, which would serve them well a year later.

Now, the same developer is back with 17 properties, one retrofit row home and 16 vacant lots. All are pursuing LEED, ENERGY STAR, and Passive House pre-certification. Equipped with the knowledge gleaned from their previous struggle, the design team is making different decisions and ensuring that their prior failures are all but guaranteed to be successes: Early energy models better defined insulation and glazing quantities. Modeling also gave the team confidence in specifying less costly mechanical systems that complement the improved envelope performance. New construction utilizes a modular, panelized system with superior insulating and air-sealing properties. For the retrofit, innovative air-sealing techniques are employed in areas where existing construction poses a threat to air-tightness and vapor transmission.

This will be an exploration of the changes and innovations implemented by the design and construction team to achieve Passive building criteria. It will also delve into the compromises and education required between a traditional builder, owner, and a Passive design specialist.

1:15-2:15 pm, Spring Room

Energy Conservation Measure: What has the Biggest Impact?

Speakers

[Peter Doo](#), Doo Consulting LLC

[Miche Booz](#), Architect, Miche Booz Architect

[Morteza Kasmaei](#), Energy Modeler, Climate Design, Inc.

Description

The Gaddy residence is a Living Building Challenge project that has earned its Petal certification as well as a verified Net Zero Energy certification. Created by the owner to be an educational tool on sustainable development and sustainable living, this house continues to fulfill that mission. Post construction, the project team chose to re-analyze the project from a cost/performance perspective. Taking our knowledge of this project and accepting the same program and performance goals, we asked ourselves, What strategies yield the greatest performance benefit for the least cost? This session will provide a quick overview of the project as constructed. We will review the drivers of the decisions that were made in the initial design and construction of the project. We will then walk the audience through the re-evaluation process and present the outcome.

1:15-2:15 pm, Fenton Room

Life, Fully Charged: Pepco's Commitment to Electric Vehicles

Speakers

[Jennifer Grisham](#), Regulatory Strategic Policy Principal, Pepco Holdings, Inc.

[Rob Stewart](#), Manager, Smart Grid and Technology, Pepco Holdings, Inc.

Description

In 2013, along with nine other states, Maryland signed a memorandum of understanding on Zero-Emission Vehicle programs. The EVsmart Program fits into this directive and will propel progress on the state's Air Quality and Chesapeake Bay goals. These include having 300,000 zero-emission vehicles on the road by 2025. Studies show that in order to meet this goal, approximately 125,000 electric vehicles (EVs) and about 27,000 public chargers would need to be added to Pepco's service territory. By offering the EVsmart Program, Pepco hopes to encourage more customers to adopt the EV lifestyle.

In this panel discussion, representatives from Pepco and Montgomery county will elaborate on the efforts made in order to enhance the electric vehicle infrastructure. Pepco's EVsmart program provides numerous resources, incentives, and benefits to customers in attempts to make driving greener a more accessible goal. Pepco's EV toolkit allows customers to learn the basics of EV charging, use savings calculators to compare the cost of gas versus electric-powered vehicles, view available state and federal tax incentives, and locate EV dealers in their area. Pepco's newly launched EV charging network is also set to grow throughout Prince George's and Montgomery counties. EV drivers will have the option to charge their vehicles at any of the 250 Pepco-owned Level 2 smart chargers or DC fast chargers throughout the service area. These stations are being installed over the course of five years, beginning with locations in Takoma Park and New Carrollton, which are currently available and ready for use. Eligible customers who live in a single-family home also receive the benefit of a residential charger rebate of \$300 for upgrading to a Level 2 smart charger. Multifamily property managers, owners, and homeowners' associations can also receive tremendous discounts on the purchase and installation of qualified Level 2 smart chargers at their properties. Whether you're an EV driver, considering buying an EV, or even a multifamily property owner, Pepco's EVsmart Program provides the rebates, tools, and information needed to charge faster, smarter, and more conveniently than ever before. Be a guest at the EVsmart panel to learn more about what is to come for electric vehicles.

2:45-3:45 pm, Ellsworth Room

Affordable Housing – Addressing Energy Efficiency in Rental and Homeownership Properties

Speakers

[Tom Deyo](#), CEO, Montgomery County Green Bank

[Jane Willeboordse](#), Regional Manager, New Ecology

[Mike Cain](#), CEO, Era Building Solutions

[Tim Craft](#), Construction Manager, ACH, Inc.

Description

Affordable housing is an important resource for all communities to assure all populations are well-served and housed. This housing is essential to the fabric of the community and it needs attention to preserve it and to assure efficient and cost-effective operating systems and budgets.

However, particular challenges confront affordable housing to introduce energy efficiency. Come to this session to learn about the challenges faced by these affordable rental and affordable homeownership condominium communities in undertaking energy efficiency improvements. The financing and operating structures, household income, and physical structure of these communities can pose constraints and boundaries around how to approach the implementation and funding of these needed improvements.

During this session, come hear about approaches to respond to the structure of these properties and the efforts some have taken to address these challenges and provide a better operating and living environment for their families. Learn about the value of energy improvement assessments and how these feed into decision-making at the property. Owners, contractors, and funders will present the lay of the land, the approach to defining the needs, the considerations each has in making decisions, and the road maps explored and followed to introduce energy savings measures that provided for more stable properties and homes for the residents.

2:45-3:45 pm, Spring Room

Net-Zero, Grid Independent Homes, in 3 Styles

Speaker

[John Spears](#), President, Sustainable Design Group

Description

Net Zero buildings work well when the grid is operating. However, when the grid goes down the net zero building loses all power. The addition of batteries makes the building grid independent and improves the resilience and security of the building.

This presentation showcases 4 local homes including three Net Zero grid independent homes; one modern design, one modern farmhouse and one in an historic traditional neighborhood and an off grid custom home. For each home, we will present the owners objectives and the design process to meet

those objectives. We will discuss, in detail, the design and construction details of each project. Finally we will discuss the cost and performance of each project.

The first project is a very modern style home. This 3,300 square foot, LEED platinum, solar home sits on a hill with a beautiful view of rural Frederick County. The walls are Aerated Autoclaved Concrete (AAC). Passive solar heating and natural cooling, 4.3 kW solar, 1.8 kW wind turbine, batteries for backup power, geothermal heating and cooling, Energy recovery ventilation (ERV) and 3000 gallons of rainwater collection. The wind turbine and the solar system provide 100% of the energy for the house and the batteries provide 3 days of backup power.

The second project is a blend of country farmhouse and contemporary architecture with state-of-the-art energy efficiency and solar power. Systems include; 6kW solar with battery backup, passive solar design, double stud wall construction, geothermal heat pump, ERV, LED lighting and Energy Star appliances. The home is 100% solar powered and charges the owners two electric cars.

The third home is a traditional home in a historic neighborhood on Montgomery County. The home is built with Structural Insulated Panels (SIP). Passive solar design provides free heat in winter and natural cooling in the summer. The 6 kW solar system provides 100% of the power for the home and charges the owner's electric vehicles. The lithium ion battery backup system powers the critical loads in case of a grid power outage. The house features custom LED lighting and Energy Star appliances. All the paint and finishes are nontoxic and non-VOC and an ERV provides continuous fresh air to maintain good indoor air quality.

The fourth project is an off grid, passive solar, healthy home built in Maryland. The home is powered by an 8 kW solar system with batteries. Heating and natural cooling are provided by the passive solar design. The South facing windows provide heating during the day. Concrete walls and slab absorb the solar heat during the day and heat the house at night. In the summer, the overhangs shade the windows and the concrete walls keep the house cool like a basement. The home is one of the healthiest homes ever built. All the materials used are nontoxic and natural. Full time ventilation keeps the humidity low to prevent mold. The electrical system was designed and all the appliances were selected to reduce EMF and dirty electricity.

2:45-3:45 pm, Fenton Room

Saving Energy and Money with Washington Gas in Residential and Multifamily Properties

Speakers

[Monica Downs](#), Senior Energy Efficiency Specialist, Washington Gas
[Josh McClelland](#), Manager, Energy Efficiency Programs, Washington Gas

Description

Montgomery County residents have a unique opportunity to improve the efficiency of their homes and save money on their utility bill when they upgrade major appliances like furnaces or boilers, water heaters, and clothes dryers. Because these appliances have an average lifespan ranging from 10 to 20

years, selecting high efficiency models can be that much more impactful in lowering utility bills, reducing energy usage, and contributing to a more sustainable energy future.

According to the U.S. Energy Information Agency, over half of the total energy used in homes in the Mid-Atlantic region each year is used to heat the home, and nearly 20% of the energy used in a home is used to heat water on a daily basis throughout the year. By choosing more energy efficient options, Montgomery County residents can reap financial and environmental benefits.

Washington Gas participates in the EmPOWER Maryland initiative, offering incentives for installing high efficiency natural gas equipment. Through the end of 2020, rebates are available to help Washington Gas customers in Maryland invest in new high efficiency appliances. Residential rebates range from \$50 to \$700 for qualifying natural gas furnaces, boilers, storage and tankless water heaters, and clothes dryers. Multifamily properties on a commercial meter can receive up to \$6250 for a large boiler and up to \$150,000 through the Custom Business Solutions program.

Washington Gas also provides a Custom Business Solutions Program, which focuses on unique or complex scenarios where the standard prescriptive programs may be unable to capture the full project scope. Custom rebates are based on actual gas savings and project cost. There is a wide range of flexibility and variability on the types and scope of projects that can be undertaken. Custom projects require more information from the customer and/or service provider and may seem daunting at first. However, these programs are here to meet the customer's energy efficiency needs. If there are measurable energy savings and the projects are cost effective, a rebate will be available.

Washington Gas will share information and case studies about the steps to finding a participating contractor; how to claim high efficiency rebates; break down the Custom rebate process; and illustrate the full opportunity of energy efficiency as a step on the "Path to Zero".