



Original Article

Power over Ethernet (PoE): Reimagining Residential Electrical Infrastructure in the United States

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Abstract - Approximately 146 million housing units comprise the U.S. residential building stock. These units are primarily powered by twentieth century 120 volt alternating current (AC) wiring architectures that were not created for today's device dense, intelligent home environments. Power over Ethernet (PoE), a technology standardized through IEEE 802.3 to deliver low voltage direct current (DC) power and data simultaneously via a single Category-rated cable, has matured through successive standards to deliver up to 90 watts per port. Although PoE has been widely implemented in commercial and enterprise settings, it has yet to be fully explored as a complementary infrastructure layer in residential construction. This article will argue that PoE offers a viable alternative to traditional wiring paradigms in terms of cost-effectiveness and safety for powering smart home devices, distributed energy management, and Internet of Things (IoT) integrations in American homes. The article includes an examination of PoE technology and standards evolution, the energy efficiency implications of centralized DC power delivery, the safety and regulatory advantages of PoE when compared to National Electrical Code (NEC) requirements, and the effects of PoE on various stakeholders including homeowners, electrical contractors, utilities, builders, and policymakers. Through the provision of an evidence-based framework for assessing the potential of PoE to transform the electrical ecosystem of the American home, the article addresses a significant void in the existing residential infrastructure literature.

Keywords - Power over Ethernet (PoE), Residential Electrical Infrastructure, Smart Home Automation, Energy Management Systems, Low-Voltage Wiring, Home Electrification, IoT Device Integration.

1. Introduction

1.1. Problem Statement

The American home is currently undergoing an unprecedented transformation in regards to electrical infrastructure. As reported by the U.S. Census Bureau, there are approximately 148.7 million total housing units as of the fourth quarter of 2025. The overwhelming majority of these units are powered by 120 volt AC wiring architectures established in the middle of the twentieth century. These homes have increasingly become hosts for a rapidly increasing number of smart home devices, electric vehicle charging equipment, rooftop solar arrays, heat pump

installations, and always-on sensor installations, all of which require advanced, fine-grained power delivery. The average U.S. household uses approximately 10,500 kWh of electricity annually, and the electronic and miscellaneous appliance categories account for 14-23% of the total residential energy usage. However, the basic model of the grid providing central AC generation and passing through branch circuits to passive outlets was never designed to support distributed intelligence or per-device power management. Consequently, the two environments (twenty-first-century digital home and mid-twentieth-century electrical backbone) represent an infrastructure mismatch.

1.2. Introducing Power over Ethernet

Power over Ethernet (PoE) is a family of IEEE 802.3 standards enabling the concurrent delivery of low-voltage DC power and data over standard twisted-pair Ethernet cables (Cat5e, Cat6, or Cat6a). Initially developed for enterprise applications such as VoIP phones and wireless access points, PoE has progressed through three major standards: IEEE 802.3af (2003) enabling the delivery of up to 15.4W of power; IEEE 802.3at (2009), also referred to as PoE+ and enabling the delivery of up to 30W of power; and IEEE 802.3bt (2018), also referred to as PoE++ and enabling the delivery of up to 60W (Type 3) and 90W (Type 4) of power using all four twisted pairs in the cable. The technology operates based on a Power Sourcing Equipment (PSE) to Powered Device (PD) architecture where the PSE (i.e., typically a managed switch or midspan injector) negotiates the amount of power delivered to each connected PD. Cable length limitations are defined at 100 meters (328 feet) under all standards. Importantly, PoE is not intended to replace AC wiring, which continues to be essential for high-current loads associated with HVAC systems, ovens, and clothes dryers. Instead, PoE serves as a very effective complementary low-voltage layer for the expanding category of devices operating within its power boundaries. [4][5][6][7][8]

1.3. The Residential Convergence Opportunity

The Four megatrends are converging to make PoE relevant to residential construction at this time. The first trend is the Smart Home Market in the United States had an estimated value of approximately \$23.72 billion in 2024 and is expected to grow at a Compound Annual Growth Rate (CAGR) of 23.4% to reach an estimated \$84.2 billion by

2030, with Household Adoption expected to reach 39% by 2027. The second trend is the Inflation Reduction Act (IRA) of 2022 allocated nearly \$9 Billion for home energy rebates and the Energy Efficient Home Improvement Credit provides up to \$3,200 annually for qualifying upgrades, further accelerating the national electrification push. The third trend is rising energy costs and the need for Demand Response and Real-Time Monitoring are driving the desire for Energy Management at the Device Level. The fourth trend is the U.S. Fire Administration reported 23,700 Residential Electrical Malfunction Fires occurred in 2023; these fires resulted in 305 deaths, 800 injuries, and \$1.5 Billion in Property Damage. All of these trends are addressed directly through the use of PoE.[9][10][11][12][13]

2. Poe Standards, Technology, and Power Architecture

2.1. IEEE 802.3 Standards Evolution

The progression of PoE standards represents a consistent increase in Power Delivery Capability tailored to the

increasing demands of Networked Devices. The Original IEEE 802.3af Standard was Ratified in 2003 and established the basis for providing up to 15.4W from the PSE, with approximately 12.95W Available to the PD after accounting for Cable Losses. This was Sufficient for Basic IP Phones and Low-Resolution Cameras. The next major jump was achieved with IEEE 802.3at in 2009, which Doubled the Available Power to 30W (25.5W at the PD), allowing for Higher Performance Wireless Access Points, Point of Sale Terminals, and Enhanced Surveillance Cameras. The Most Significant Leap was achieved with IEEE 802.3bt in 2018, which Introduced Type 3 (60W) and Type 4 (90W) Power Classes Using All Four Twisted Pairs in the Cable for Power Delivery. The Four-Pair Architecture Not Only Increases Total Power Capacity, But Also Reduces Per-Conductor Current, Improving Efficiency and Reducing Thermal Stress. Table 1.1 Summarizes the Key Specifications Across Standards.[5][14][7]

Table 1: PoE Standard Comparison

Standard	Year	Max PSE Power	Max PD Power	Pairs Used	Cable Type	Typical Applications
IEEE 802.3af (PoE)	2003	15.4W	12.95W	2	Cat5e+	IP phones, basic cameras
IEEE 802.3at (PoE+)	2009	30W	25.5W	2	Cat5e+	Wireless APs, PTZ cameras
IEEE 802.3bt Type 3 (PoE++)	2018	60W	51W	4	Cat5e+	LED luminaires, building automation
IEEE 802.3bt Type 4 (PoE++)	2018	90W+	71W	4	Cat5e+	Digital signage, high-power APs [4][5][14]

2.2. PSE and PD Architecture

In a PoE System, the PSE is the Power-Sourcing Element, Typically Embodied in a Managed PoE Switch or a Midspan Injector. The PSE Performs Power Classification Negotiation with Each PD Upon Connection, Determining the Device's Power Class and Allocating Appropriate Wattage. The Negotiation Protocol Prevents Overloading and Ensures That Only Compliant Devices Receive Power. When Deploying PoE in Residential Settings, There Are Material Implications Between the Choice of a Centralized PoE-Capable Managed Switch and Distributed Midspan Injectors. A Managed Switch Provides Centralized Budgeting of Power, Telemetry for Each Port, Remote Management, and the Ability to Schedule or Shed Power From Individual Devices, Capabilities Essential for Home Energy Management. Midspan Injectors Lack These Features, and Are Better Suited for Targeted Single-Device Installations.[7]

2.3. Cable Requirements and Distance Constraints

PoE Operates Over Standard Category Rated Unshielded Twisted Pair (UTP) Cable, With Cat5e Being the Minimum Specification and Cat6a Being the Preferred Specification for Higher-Wattage 802.3bt Applications. Cat6a Cable Has Thicker 23 AWG Conductors Than Cat5e's 24 AWG, Resulting in Lower DC Resistance and Improved

Heat Dissipation Characteristics Important at Higher Power Levels. The Maximum Cable Run Length Is 100 Meters (328

Feet) Under All PoE Standards, Providing Ample Cable Runs for the Majority of Residential Floor Plans. A Study Conducted at the U.S. Department of Energy's Pacific Northwest National Laboratory Found That Cable Energy Loss Can Be Limited to Less Than 5 Percent When Following ANSI C137.3 Guidance and Maintaining Average Cable Lengths At Or Below 50 Meters. For Particularly Large Homes, Intermediate Switch Closets or PoE Extenders May Be Necessary To Provide Effective Coverage for All Zones.[6][8][15][16]

3. The U.S. Residential Energy Landscape and the Case for Poe

3.1. Residential Energy Consumption Patterns

American households consumed approximately 1.55 trillion kWh of electricity in 2024, representing the largest single sector of U.S. electricity demand. The U.S. Energy Information Administration (EIA) reports that the average household consumes about 10,500 kWh annually, at an average retail rate of 16.48 cents per kWh. Within this consumption profile, space heating and cooling account for approximately 51% of usage, water heating for 19%, lighting for 9%, and electronics and appliances for the remaining 14 to 23%. It is this latter category, encompassing smart devices, networking equipment, security systems, and

always-on consumer electronics, that falls directly within PoE's addressable power envelope.[17][2][18][19]

3.2. The Inefficiency of Distributed AC-to-DC Conversion

A fundamental inefficiency in the current residential paradigm is the proliferation of individual AC-to-DC power adapters. Each smart home device operating on DC power (which includes virtually all electronics) requires its own adapter or internal power supply to convert 120V AC to the required DC voltage. These adapters vary widely in efficiency, with many consumer-grade units operating at 70 to 85% conversion efficiency, and most drawing phantom (standby) power even when the connected device is idle. In a home with 20 to 40 such adapters, the aggregate conversion losses and idle power draws become non-trivial. PoE addresses this by consolidating AC-to-DC conversion in a single high-efficiency power supply within the PoE switch. The switch's centralized power supply typically achieves 88 to 91% efficiency depending on load, and the DC-to-DC conversion at each PD endpoint incurs lower losses than a full AC-to-DC conversion would. Industry estimates suggest that centralized DC power delivery through systems like PoE can yield 10 to 20% energy savings compared to distributed AC adapter architectures.[20][21][16]

3.3. Policy Alignment: IRA and State Energy Codes

The Inflation Reduction Act's Home Electrification and Appliance Rebates (HEAR) program provides up to \$14,000 for qualifying electrification upgrades for low-income households, while the Home Efficiency Rebates (HER) program offers cash back for projects that reduce energy use by 20% or more. Although PoE infrastructure is not yet explicitly named in IRA rebate categories, PoE-enabled smart home energy management systems that contribute to measurable efficiency gains could qualify under broader efficiency provisions. California's 2025 Title 24 Building Energy Code, effective January 1, 2026, emphasizes demand flexibility, smart thermostats that access energy pricing information, and enhanced lighting controls. These requirements align naturally with PoE's capabilities for per-device control, scheduling, and real-time telemetry.[22][23][24][25]

4. Smart Homes, Iot, and Poe

4.1. Device Categories within the PoE Power Envelope

Most smart home devices do not exceed the power output provided by today's PoE standards. Most IP security cameras operate using 7 to 25W, most smart LED light fixtures run at 3 to 25W, most door access controls and smart locks draw 5 to 15W, all environmental sensor devices draw less than 5W, all Wi-Fi access point devices use 10 to 30W and all VoIP devices use 5 to 13W. With IEEE 802.3bt able to provide 90W of power per port, even high-power pan-tilt-zoom cameras, multi-radio wireless access points and full LED light fixtures can be supported comfortably. [26][27]

4.2. Network Convergence: One Cable for Power and Data

The most significant benefit of PoE for smart homes is network convergence. Using a single Cat6a wire, PoE delivers both power and gigabit data to each device, thereby

removing the necessity for running independent power wires and low-voltage signal wiring. This greatly reduces the complexity of installation and results in fewer wall penetrations, lower conduit requirements and an overall neater and cleaner install footprint. For new builds, a correctly designed structured cabling plant with a central equipment closet will provide a foundation for the entire smart home system. The centrally located, managed PoE switch will act as the "brain" of the smart home and provide power management, network connectivity, remote monitoring of devices, and integration with the building automation controller(s). [27][28]

4.3. Poe and Smart Home Protocols

Smart home protocols (e.g., Zigbee, Z-Wave, Thread, etc.) rely on border routers/hubs that connect the local wireless mesh networks to the home's IP network. PoE powered wireless access points or smart home hubs will also function as constant mesh network coordinator devices and ensure reliable communication between the smart home devices (battery powered sensors/actuators) regardless of their location in the home. Therefore, PoE provides the wired infrastructure supporting the wireless edge devices, creating a hybrid network architecture that combines reliability and flexibility. [29]

4.4. PoE Lighting: A Transformative Application

PoE lighting represents one of the most mature and commercially viable smart home applications utilizing PoE technology. As per IEEE 802.3bt, the power delivered via PoE is sufficient to support full LED luminaire operation for ambient lighting purposes. Moreover, PoE lighting offers additional benefits over traditional lighting systems, such as per-lamp dimming capability, color temperature adjustment capability and occupancy detection capability, all integrated into the power circuitry. It is estimated that the global PoE lighting solution market size will reach \$693.7 million by 2025, with a compound annual growth rate (CAGR) of 25.4% during this period. Commercially, it has been shown that using PoE for lighting can result in 50% reduction in lighting operational expenses through granular control of lighting levels and occupancy based scheduling. Furthermore, case studies like the deployment of 2,500 PoE powered lights across 1.2 million square feet at Cisco's Canadian headquarter at RBC WaterPark Place in Toronto, demonstrate that large scale deployments of PoE lighting systems can deliver significant energy cost savings. [26][30][31]

5. Safety, Fire Risk, and the NEC Regulatory Framework

5.1. Residential Electrical Fire Statistics

Between 2014 and 2023, the U.S. Fire Administration reported that there were 23,700 electrical malfunction fires in residential buildings. These fires resulted in 305 fatalities, 800 injuries, and over \$1.5 billion in property damage. Between 2014 and 2023, residential electrical fires have shown a 2% overall increase. However, the amount of money lost due to residential electrical fires increased by 28%. Based on estimates from the National Fire Protection

Association (NFPA), electrical failure or malfunction caused approximately 44,880 home fires per year, resulting in 440 deaths and \$1.3 billion in property damage, during the years from 2012 through 2016. Arc faults, circuit overload and worn out wiring were some of the most common causes of these electrical fires. Thus, statistics demonstrate a structural deficiency in safety in the existing AC system that low-voltage alternatives can reduce the occurrence of electrical fires.[32][10][33][34]

5.2. The Safety Advantage of Low-Voltage DC

The voltage range for PoE systems is 44-57 volts DC; this is lower than the threshold for significant electrocution risk for humans. Therefore, at these voltage ranges, the potential energy delivered through one wire is insufficient to generate the type of arc faults that ignite insulation and/or other combustible materials around them. A further layer of safety was added to the IEEE 802.3 PoE negotiation protocol to ensure the handshake between a PSE and a PD takes place prior to the delivery of power to a port. A PSE will not provide power to a port until a compliant PD has been detected and classified, and it will remove power when the device is disconnected or begins to draw abnormal currents. The "handshake prior to power" feature of PoE has no counterpart in traditional AC wiring, as receptacles are

always energized regardless of what device(s) is/are connected.[35][27]

5.3. NEC Article 725 and Class 2 Circuit Classification

According to the National Electrical Code (NEC), published by the National Fire Protection Association (NFPA) as NFPA 70, PoE installations fall under the purview of NEC Article 725 which regulates the use of Class 2 and Class 3 remote-control, signaling and power-limited circuits. Class 2 circuits have limits of 30 volts and 100 VA and are considered to be of such low power that they represent little or no risk of electric shock or fire. Therefore, the NEC allows for less restrictive installation requirements for Class 2 wiring than would normally be required for higher voltage wiring. For example, Class 2 wiring may run in direct contact with structural components of buildings without extensive conduit protection. Depending on the state, Class 2 wiring installations may not require a licensed electrician, which enables individuals who are trained in structured cabling and/or IT to install and perform maintenance on PoE networks. The data provided in Table 1.3 illustrates the comparative regulatory implications of AC and DC wiring.[36][37][27]

Table 2: Regulatory Comparison: Traditional AC Circuits Vs. Poe Low-Voltage Wiring

Parameter	120V AC Branch Circuit	PoE (Class 2/Low-Voltage)
Governing Code	NEC Articles 210, 220, 240	NEC Article 725 (Class 2)
Typical Voltage	120V AC	44-57V DC
Typical Installer	Licensed electrician	Structured cabling tech / IT professional
Permit Required	Yes (most jurisdictions)	Rarely / varies by jurisdiction
Arc Fault Risk	Significant	Negligible
Electrocution Risk	Potentially lethal	Very low
Inspection Regime	Rough-in and final inspection	Minimal or none [36][37][27]

6. Stakeholder Impact Analysis

6.1. Homeowners and Residents

For homeowners, PoE provides a strong value proposition based on several factors. Smart device retrofit installation costs decrease due to lower voltage wire that does not require a licensed electrician in many jurisdictions; additionally, per port power telemetry from managed PoE switches enable device-level energy monitoring without additional metering hardware. Each device is powered, communicated with and controlled via one cable run thus expanding and reconfiguring smart home systems is simplified. There are immediate safety benefits: removing AC powered smart devices with their high voltage wiring from living areas, using PoE enabled smart devices instead. As smart home readiness becomes a premium feature in real estate, the U.S. smart home market is trending toward 39% household adoption by 2027. Thus, PoE ready homes have the potential to be a premium attribute in residential sales. [11][27][28]

6.2. Electrical Contractors and Builders

PoE represents both opportunities and disruption for the electrical contracting industry. On the positive side, structured cabling design, PoE switch specifications, and

ongoing system maintenance represent new revenue streams for forward-thinking contractors. Additionally, the integration of electrical and networking disciplines create a higher-value service category that generates premium project fees. However, there is a very real disruption risk: if low voltage PoE installations create less demand for licensed high voltage rough-in work in smart zone areas of new construction, then electricians may lose their jobs. The best position is a hybrid design approach, where PoE is positioned as a complementary technology that expands the overall project scope rather than being a replacement. There is a large knowledge gap. While BICSI RCDD (Registered Communications Distribution Designer) and CEDIA EST (Electronic Systems Technician) certifications address structured cabling and smart home integration, most IBEW electricians do not have formal education in IP networking, cable termination, or configuring switches. [26][38][39]

6.3. Utilities and Grid Operators

PoE-enabled homes give utilities an unparalleled amount of granularity when it comes to managing their load. Centralized PoE switches can interface with utility demand response (DR) platforms to disconnect non-critical loads, such as turning off lights or stopping video recording

cameras during peak demand periods. This granular load control is far superior to the coarse load control provided by traditional smart thermostats or breaker-based demand response. Further, combining PoE with solar photovoltaic and battery storage represents a compelling DC microgrid concept: solar panels produce DC power, batteries store DC, and PoE distributes DC power to endpoints thereby eliminating the inverter loss associated with DC-to-AC-to-DC conversion chains. According to industry analysts, DC microgrids can realize 10 to 20 percent energy savings via reduction of conversion losses. PoE switches serve as intelligent energy nodes at the grid edge, enabling them to report consumption, respond to pricing signals, and coordinate with electric vehicle chargers. [21][40][41]

6.4. Technology and Device Manufacturers

For product manufacturers, PoE eliminates the need to include a power adapter with each product, resulting in lower bill-of-materials (BOM) costs, smaller packaging sizes, lighter shipping weights, and improved device reliability via removal of the most common failure point. The global PoE solutions market is anticipated to increase from \$3.5 billion in 2026 to \$10.8 billion by 2033 at a compound annual

growth rate (CAGR) of 17.5%. The PoE chipset market is estimated to reach a CAGR of 10.43% by 2030 from its current value of \$610 million in 2023. Active participants in the residential PoE ecosystem include standards organizations such as IEEE, CEDIA, and the Continental Automated Buildings Association (CABA). [42][43][44][45]

6.5. Policymakers and Regulators

Construction of PoE-enabled homes will support the goals of the Department of Energy's Efficient New Homes program (formerly the Zero Energy Ready Home program), which identifies and recognizes homes that exceed expectations for energy efficiency and grants a federal 45L tax credit of up to \$5,000 for certified homes. If PoE-readiness were embedded in the International Energy Conservation Code (IECC) updates for new construction, this would provide a code path for adoption. In addition, California's 2025 Title 24 Energy Code already emphasizes demand flexibility, smart controls, and heat pump integration, providing a regulatory framework where PoE's control features directly contribute to compliance. The FCC's role may also evolve as the lines between electrical and network infrastructure in homes continue to blur. [25][46]

Table 3: Stakeholder Impact Matrix

Stakeholder	Primary Benefit	Primary Risk	Policy Lever
Homeowners	Lower install costs, device-level energy monitoring, safety	Upfront infrastructure investment, technology learning curve	IRA rebates, smart home market growth
Electrical Contractors	New revenue from structured cabling and system design	Displacement of traditional high-voltage work	BICSI/CEDIA training, hybrid design positioning
Utilities	Granular demand response, grid-edge intelligence	Integration complexity with existing DERMS platforms	DR program incentives, rate design
Device Manufacturers	Lower BOM costs, improved reliability, market growth	Fragmented standards, residential product gaps	IEEE standards adoption, residential PoE certification
Policymakers	Alignment with electrification and safety goals	Regulatory lag behind technology deployment	IECC/NEC code updates, building certification programs [9][42][46][10]

7. Limitations

7.1. Power Ceiling Constraints

The constraints of IEEE 802.3bt Type 4's maximum 90W limit PoE's capability to provide power to devices inside its power envelop. While appliance electrification through PoE can be used to electrify appliances such as HVAC, cooking, water heating and laundry, it will still be much easier and cheaper to use conventional AC wiring. Therefore, PoE should be viewed as a complementary layer and not a replacement for AC. Clarity of message on this point is required to prevent the creation of unrealistic expectations about what is possible using PoE. [5]

7.2. Distance Limitations

There are very few residences that have a distance greater than 100 meters. Larger estate homes and single-story homes can have distances greater than 100 meters and therefore can require an intermediate closet or an Intermediate PoE extender. Adding an additional closet adds both cost and complexity as well as creating a potential point of failure. [8][6]

7.3. Interoperability Fragmentation

Vendor proprietary PoE extension implementations can cause interoperability problems. For example, Cisco's Universal PoE (UPoE) and Ubiquiti's passive PoE implementation and similar vendor specific extensions may not properly communicate with third party switches and therefore could result in a PoE fault which would cause a device failure. It is important to ensure that all components adhere to IEEE 802.3 standards, however in reality this is not always possible. [50] [51]

7.4. Installer Knowledge Gap

Most residential electricians are formally trained in high voltage AC wiring. Many residential electricians do not have formal training in structured cabling, IP networking, VLAN configurations, or managing PoE switches. Training programs that bridge the gaps in these areas by combining aspects of BICSI, CEDIA, and traditional electrical apprenticeships will be necessary to prepare residential electricians to install PoE systems. [39][27]

7.5. Residential Product Ecosystem Immaturity

Most of the available PoE hardware including switches, luminaries, and sensors has been developed for the commercial and enterprise markets. There are few residential products that have been specifically designed to meet the needs of the residential market including being aesthetically pleasing, having easy-to-use management interfaces, and being priced competitively with other residential products. If manufacturers want to see widespread residential adoption of PoE they will need to develop purpose built residential products. [43]

8. Conclusion

Power over Ethernet (PoE) is not an exclusive, specialty technology for large corporate server rooms or commercial office floors. Rather, it represents a fundamental infrastructure layer of the intelligent American Home. As evidenced throughout the body of this research, PoE has proven itself to be a comprehensive solution addressing all four key elements of residential infrastructure modernization: 1) Energy Management - through centralized DC conversion and device-by-device telemetry; 2) Smart Home Integration - through single-cable convergence of power and data; 3) Safety - through low voltage operations resulting in a significant reduction of both arc fault and electrocution risks; and 4) Stakeholder Economics - through lower installation costs, the creation of new professional services opportunities, and the ability to provide utilities with granular demand response information regarding each individual device in a home.

The Convergence moment has arrived. IEEE 802.3bt has provided enough power to enable the vast majority of residential smart devices to operate without the need for a separate power source. Structured Cabling Materials are widely available in mass-market quantities and are well understood by virtually every electrical contractor. According to numerous market studies, smart home adoption is expected to grow to 39 percent of all U.S. households by 2027. Additionally, federal electrification incentives have been created through the Inflation Reduction Act, and various state level energy codes such as California's Title 24 are now in place to encourage the specific control and monitoring capabilities that PoE offers. The Recommendation for Builders is Clear. Build all new homes with Cat6a structured cabling and provide a network closet for PoE switches. This can be done at an incremental cost that is less than one-half the life-cycle value of the infrastructure.

The Path forward for electrical contractors is hybrid positioning. Electrical contractors should position themselves to take advantage of structured cabling as a complementary discipline that expands their project scope and revenue opportunities.

Utilities have much to gain from PoE-Enabled Homes. PoE-enabled homes will allow utilities to better manage loads on a per-device basis at the "grid-edge," representing the next generation of demand response granularity.

Updating the International Energy Conservation Code (IECC), National Electric Code (NEC), and other building codes to officially recognize and encourage the inclusion of PoE-readiness in new residential construction would further accelerate widespread adoption and establish formalized safety benefits that exist in the use of PoE technology. The Home of 2030 Will Be Defined Not by Its Outlets, But By Its Data Ports. The wiring that connects, powers and intelligently manages the devices within our living spaces will define not only how efficiently we consume energy, but also how safely, how flexibly and how sustainably we live in the built environment. Power Over Ethernet (PoE) is the Infrastructure Platform That Makes This Vision Possible today.

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