The Future is Bright: PoE Perseveres Towards Mainstream Adoption

For over two decades, power over Ethernet (PoE) has quietly revolutionized networks by converging power and data to connected devices over a unified infrastructure. Beginning with the ratification of Type 1 IEEE 802.3af in 2003, which enabled the delivery of up to 15.4 Watts (W) of DC power over balanced twisted-pair Ethernet cables, PoE technology made significant strides in its first 15 years. The ratification of Type 2 IEEE 802.3at in 2009 expanded power delivery to 30 W, which was followed just two years later by Cisco's Universal PoE (UPOE) to provide up to 60 W. Then came the 2018 ratification of Type 3 and Type 4 IEEE 802.3bt, enabling up to 60 and 90 W of PoE power, respectively. With each advancement, the landscape of PoE-enabled devices continued to expand, progressing from simple VoIP phones and basic surveillance cameras to high-throughput wireless access points (WAPs), connected LED lighting fixtures, laptops, point-of-sale machines, digital touchscreen displays, window shades, TVs, and more.

While PoE is a long-proven technology that has significantly benefited millions of building owners and operators worldwide, widespread adoption has been more gradual than many industry experts initially anticipated. But in an era defined by the need to drive operational efficiencies, the proliferation of IoT, and the demand for ubiquitous connectivity, PoE now

stands poised for greater adoption across diverse verticals, especially as emerging trends and technologies help pave the way.

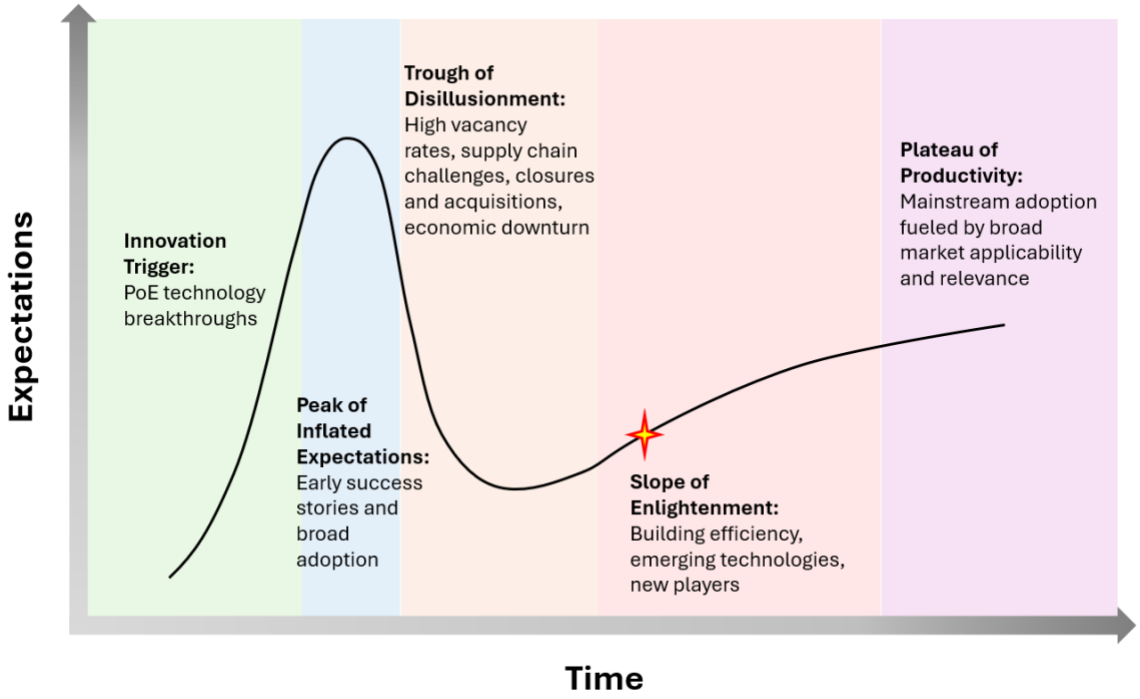
From Hype to Hope

The Gartner Hype Cycle offers a valuable lens to assess the maturity and adoption of emerging technologies like PoE. This framework outlines five key phases of a technology's life cycle: Innovation Trigger, Peak of Inflated Expectations, Trough of Disillusionment, Slope of Enlightenment, and Plateau of Productivity.

Based on market growth and substantial numbers of successful deployments, PoE progressed through the initial two phases of the Hype Cycle in its first 20 years. The hype behind the technology is no surprise. By eliminating the need for AC power circuits and associated conduit for networked devices, PoE substantially lowers material and installation costs. Operating at a safe, low-voltage level of no more than 57 volts with a maximum power output of 90 W, PoE systems can also be installed and maintained by network professionals rather than licensed electricians for even greater savings.

Despite the benefits, the rate of PoE adoption slowed between 2020 and 2023 as the technology navigated the Trough of Disillusionment. This slowdown was primarily due to a confluence of economic and market challenges. The COVID-19 pandemic increased commercial vacancy rates and disrupted global supply chains, causing a slowdown in new building construction. At the same time, some significant PoE players either closed their doors, underwent acquisitions, or scaled back product development, while the economic downturn highlighted the higher upfront costs associated with PoE lighting deployments compared to traditional line voltage systems.

While some remain cautious, the emergence of smart building initiatives and new technologies effectively shedding light on the advantages of in-building DC power distribution are propelling PoE into the Slope of Enlightenment and hopefully toward a future of mainstream adoption.



Momentum is Building

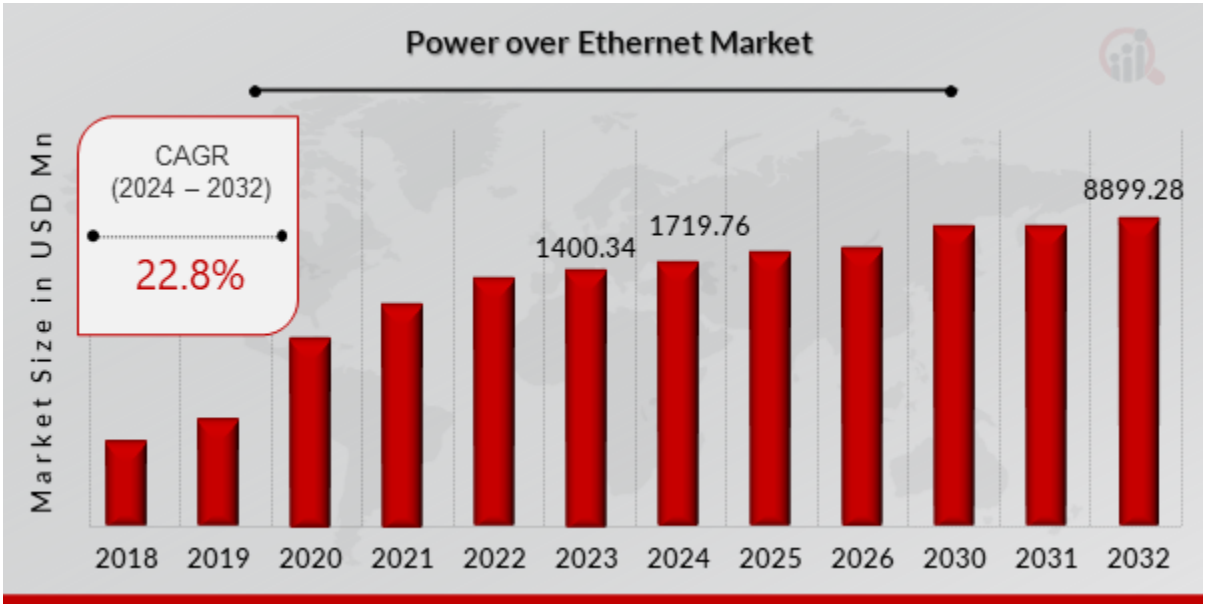
Despite gradual adoption, recent years have still shown compelling positive momentum and growing industry support for PoE. In 2021, the Ethernet Alliance launched its second-generation PoE Certification program for IEEE 802.3bt Type 3 and Type 4 PoE. The PoE Consortium, a joint venture of companies covering all aspects of the PoE landscape—devices, lighting, cabling, testing, design, installation, and training—was founded in late 2022 to promote education and best practices. A 2022 LEDs Magazine survey further underscored this trend, with respondents ranking PoE as their preferred choice for connectivity and more than 73% of respondents indicating no significant drawbacks from deploying PoE systems.

At the same time, today's need to reduce the environmental impact of buildings and enhance efficiency through smart building technologies is now boosting PoE device development and adoption. A major benefit of PoE is its capacity for enhanced device monitoring, control, and backup power from one centralized location, allowing insights into energy usage and enhanced building automation. Take PoE lighting for example. Connecting and powering energy-efficient LED fixtures transforms a facility's lighting system into an intelligent platform, facilitating granular lighting control and integration with IoT sensors and other building systems for automatically adapting to ambient light levels, occupancy, and other environmental factors. Since today's connected electronic

components operate via DC power, PoE also provides sustainability and cost benefits by reducing energy losses associated with traditional AC-to-DC power conversion. The U.S. Green Building Council's (USGBC) LEED program even began awarding additional points for DC power distribution infrastructure.

These benefits are echoed by noteworthy real-world adoption, including millions of square feet of connected lighting. Some recent examples across the country include the net-zero Hotel Marcel in New Haven, Connecticut, which opened its doors in 2022 with PoE for lighting, shades, and in-room amenities throughout its 165-room boutique establishment. In 2023, Southwire, a major provider of MC copper cables used in traditional AC-based line voltage lighting systems, embraced PoE lighting for its new Atlanta office space to improve efficiency. Mouser Electronics, the world's largest distributor of electronic components, recently revealed a DC power infrastructure with PoE lighting for energy savings, enhanced lighting control, and operational efficiency at its new 416,000-square-foot Dallas-Fort Worth distribution center expansion. The market has also seen a surge in innovative PoE products, including a broader range of smart building devices, industrial power sourcing equipment, lighting control switches, and testing solutions.

As commercial real estate vacancy rates return to normal, building owners and operators adopt more smart solutions, and the industrial sector embraces IoT, PoE adoption is expected to continue its upward trend. Recent reports project the PoE market to grow at a compound annual growth rate (CAGR) of 22.8% from 2024 to 2032.[i] The PoE lighting market alone is expected to grow more than 23.5% over the next five years, reaching $1.62 billion by 2030 compared to just $454 million in 2024.[ii]



Source: Market Research Future

Power for an Intelligent Future

Looking ahead, emerging technologies that have been getting a lot of recent attention have the potential to further amplify PoE's trajectory. While still in its infancy, the advent of Class 4 Fault-Managed Power (FMP) systems, now recognized in the latest edition of the National Electric Code (NEC®) and able to deliver higher levels of DC power over greater distances, paves the way for all-DC power building distribution infrastructure and the potential for broader PoE deployments. Innovations in cabling, such as extended-reach cables and single-pair Ethernet (SPE), address PoE distance limitations and open new deployment possibilities. Remote adapters that convert SPoE to PoE are already powering and connecting basic surveillance cameras over distances up to 1000 meters.[iii]

Even emerging Artificial Intelligence (AI) is a powerful catalyst for PoE adoption. Edge AI use cases across several sectors—from smart buildings and cities to healthcare, transportation, and manufacturing—increase demand for real-time data and intelligent action from connected IoT devices, perfectly aligning with PoE's inherent capabilities for both power and data connectivity.

Only time will tell if PoE achieves true mainstream adoption and its projected growth over the next five years. However, the fact remains that PoE is not a new technology—it's been reliably powering a wide range of connected devices for more than 20 years across diverse sectors, including commercial offices, schools, hospitals, factories, warehouses, retail, hotels, casinos, data centers, and more. Now, the convergence of strong industry backing, tangible real-world deployments, groundbreaking technological advancements, and the burgeoning demands of AI positions PoE not just as a cost-effective alternative for powering LAN devices, but as a foundational power and data infrastructure for the intelligent future.

---

[i] Power Over Ethernet Market Research Report, Market Research Future, May 2025
[ii] Power Over Ethernet Lighting Market by Offering, Wattage, Application - Global Forecast 2025-2030, October 2024
[iii] 10Base-T1L Single Pair Ethernet 1000-Meter Reach Networking and Power: The Most Cost-Effective Option, March 2024