# THE FUTURE-READY UTILITY

Honeywell is building a resilient energy system for our connected future, starting with utilities

Honeywell

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# ABSTRACT

**Our sustained reliance on what reaches us through overhead power lines and underground infrastructure underpins utilities' extreme importance today — and just how imperative it is for them to remain resilient tomorrow. No matter the gaps or limitations or missing pieces that may appear as utilities navigate modernization at different paces, Honeywell empowers readiness for a future of massive change.**


Our homes, our office buildings and other commercial facilities are constant consumers of natural gas and electricity, both resources having powered our lives for a long time. Ceiling lights, heated rooms, computer-driven workstations, essential equipment that runs nonstop — we've never known a world without these because gas and electric utilities work behind the scenes, 24-7, for steadiness, availability and continuity, especially at the distribution level.

To maintain this stability, deliver power to end-users, manage local infrastructure and respond to outages, utilities' fundamental structures and services are evolving. Interconnected, digitalized and decentralized operations are replacing those that are independent, unregulated and centralized. Technology transforms efficiency. Data informs smarter decisions. It's all happening at the right time, but this forward progress has friction.

New, emerging and megawatt consumers like artificial intelligence (AI), data centers and electrification are adding pressure to an already stained and aging grid, further tipping the scales toward greater energy demand rather than a larger supply. Extreme weather events threaten grid reliability too, creating potential energy shortages. Digital technologies, while a key component of real-time utility management, keep critical infrastructure vulnerable to cyberattacks. And the entire industry faces a shortage of skilled workers *and* an existing workforce that's set to retire soon.

Honeywell helps electric and gas utilities overcome these multi-sided stressors and take greater control of their transformations with an outcome-based approach and utility portfolio built for the foundation they've created — and one that's ready for the future. Considering life safety and security, operational efficiency and cybersecurity, we provide the tools and guidance to align every element into a stronger, more reliable utility.

# INTRODUCTION

**The uptime of energy systems is essential to the modern life of millions. Everything needs predictable and reliable utilities, which means energy technologies, distribution infrastructure and operations have to support today's demands, adapt to rapid innovation and withstand what will occur a decade from now.**

Utilities know this. It's why 80% of North American utilities have digital grid technologies in some capacity.[1] Whether smart meters or management platforms or AI (or all three), digitalization and the real-time data analytics they provide improve reliability through better awareness and quicker responsiveness. Distributed energy resources (DERs) also put grid reliability first by making our energy supply more predictable and by decentralizing demand. So far, more than half of electric utilities in a recent survey recognize DERs as a viable solution to help lower peak loads, which keeps strain off the grid and keeps the lights on.[2]

Yet for every opportunistic step in the future's direction, today's challenges threaten to pull utilities' advancements back. The overall age of infrastructure is a concern: almost one-third of natural gas distribution lines were installed before 1970.[3] This creates extreme safety hazards and jeopardizes efficiency — as residential pipelines' ages increase, so do the risks of leaks, fires, explosions and incident-based downtime. Our current and future energy systems can't operate effectively with infrastructure that was built for our energy system 50 years ago.

Additionally, utilities can't perform optimally as skilled workers retire without replacements. Losing more than 25% of the utility in the workforce within the next decade isn't just a reduction in personnel; it's the imminent absence of the critical skills, efficiency and institutional knowledge that our grid, our homes and our businesses need for the reliable delivery of essential services.[4]

Utilities have resistance and momentum. Inertia and acceleration. Stress and resilience. But with Honeywell, all friction becomes forward progress. We bring every new and existing piece into perfect alignment, strengthening electric and natural gas utilities by prioritizing life safety and security, operational efficiency and cybersecurity:

**Life Safety and Security**
We help utilities safeguard personnel, secure critical sites and stay compliant with evolving safety standards through integrated, human-centric technologies.

**Operational Efficiency**
Distribution asset performance can depend on our automation and analytics portfolio; each device, software and service optimizes reliability through real-time, actionable insights.

**Cybersecurity**
Combining segmentation, monitoring, encryptions and managed detection, we embed end-to-end control and protection into utility processes from the start, instead of re-supplementing infrastructure and operations as new threats are introduced.

**In the pages that follow, discover how Honeywell helps utility operations become ready for what's next, one layer of predictability and reliability at a time.**

# UTILITIES' FIRST LAYER OF DEFENSE

# 1

**The continuity of essential services like electricity and natural gas means distribution assets must be methodically and completely hardened against expected threats and uncontrollable factors.**

Some of utilities' most *specialized* personnel are their most *at-risk* personnel. Technicians who work in the field, maintaining connections and meters, are the ultimate conduit between principal resources and their final destinations. But outdated, leaking infrastructure can cause fast fires and explosions; extreme weather can inflict accidental, dangerous damage to pipelines that goes unnoticed until it's too late; tampering can affect the integrity of assets and employee wellbeing. Across North America, these challenges distress gas utilities most often:

- A 2020 Environmental Protection Agency Study estimates more than 500,000 leaks across the United States' local gas distribution infrastructure occur from wear, equipment failures and natural causes.[5]
- In October 2025, seven people were injured as a result of a gas explosion at a Toronto construction site for a commercial building.[6]
- And after an extremely windy and stormy day, a gas station in Chicago exploded after natural gas lines caught fire.[7] The flames spread to nearby trees and powerlines, which created the potential for additional outages; subsequent explosions were also reported. This incident occurred in July 2025.

A lack of visibility, timely alerts and remote control capabilities can keep workers, sites and customers in unsafe conditions longer, especially since half of U.S. homes, seven million Canadian families and countless businesses rely on natural gas.[8,9] For more traditional systems and those moving toward modernization, we have proven technologies at the meter level and beyond that help utilities identify, detect and respond to life safety and security risks earlier:

DEVICE

**NXU Residential Smart Gas Meter**

This meter has industry-best intelligence and features for residential gas leak prevention, including an integrated remote shutoff valve and ultrasonic technology that measures abnormal flow rates. If abnormalities are detected, utilities can stop the flow of gas remotely. This helps prevent disasters — and isolate incidents if they occur.

SOFTWARE

**Honeywell Forge Performance+ for Utilities**

HONEYWELL FORGE Performance+ for Utilities

This digital platform collects, stores and analyzes data from smart devices in real time, equipping gas utilities with a complete, organized view of all assets and resources. Improved data accessibility and faster action-taking help secure gas-related operations.

SERVICE

**Line Locating Technology**

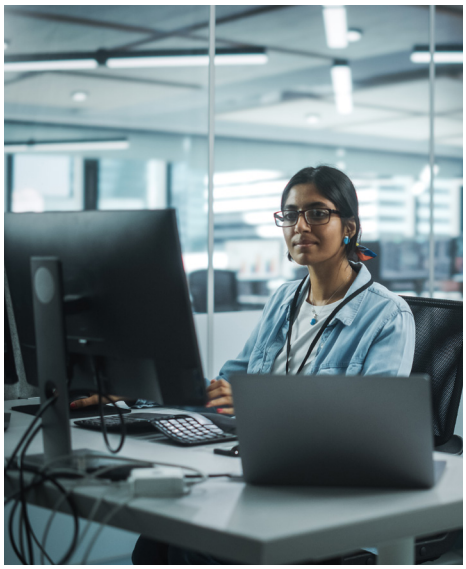
With survey-grade GNSS accuracy, our line locating service and technology can capture utility locates within 1″ of their exact location. This helps utilities identify compromised infrastructure faster or prevent strikes that can cause leaks.

Measurable reductions in uncertainty and smaller probabilities of high-impact events help safety interventions happen faster, protecting personnel, homes and buildings. Both are fueled by Honeywell's relentless pursuit of optimal life safety and security outcomes.

# OPERATIONAL EFFICIENCY AT THE EDGE

# 2

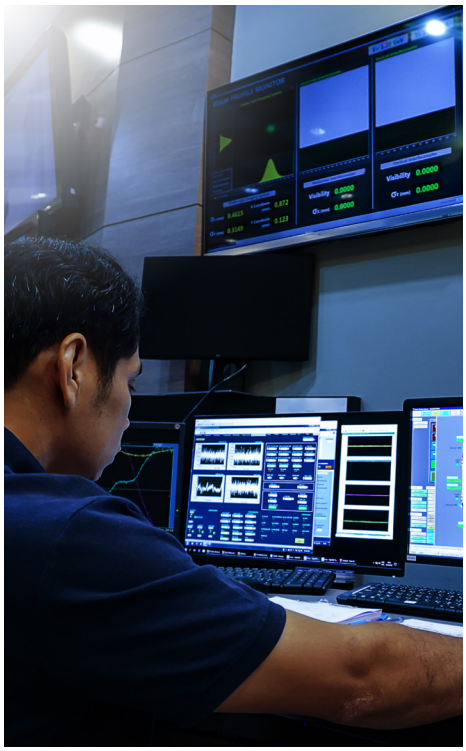
**The shift from reactivity to proactivity has strong ties to operational efficiency, a key component on utilities' journey to become more ready, reliable and predictable.**



When utilities improve their operational efficiency first, through real-time visibility, condition-based monitoring, automation and forecasting, then the capacity for future modernization becomes bigger and the chances of downtime become almost non-existent.

These transformation-enabled capabilities share the same core: data. Actionable insights and analytics, from the field to the control room, help operators see events before they happen, manage incidents before they occur and solve challenges before they exist in the public. In the right hands, historical data, trends, real-time readings and analytics tools can help alleviate the different causes of operational strain.

| CHALLENGE | SOLUTION |
|---|---|
| **AGING WORKFORCE**<br>Half of the utility workforce is aged 45 years or older and many retiring within the next decade.[10] The loss of experienced personnel creates slower response times and inconsistent operational standards as new generations enter the workforce (at a speed that isn't fast enough). | **Real-time** dashboards and **data-driven** recommendation engines reduce utilities' dependency on tribal knowledge, displaying where, when, why and how something can be fixed. |
| **NEW CONSUMERS**<br>A surge in demand from AI, electrification and data centers can strain infrastructure, leading to blackouts and outages if not managed correctly. As just one layer of this increase in consumption, data centers will require almost 300% more electricity to operate in the next decade.[11] | When they're made visible, consumption data, peaks and other metrics indicative of strain can help utility operators identify high-risk areas and assets before they interrupt service. **Forecasting** can also help utilities allocate the right resources during times of stress, responding to demand most efficiently. |
| **UNRELIABLE INFRASTRUCTURE**<br>When outages, leaks and unplanned downtime occur, resources are often pulled from existing work to triage events. As infrastructure ages without intervention, this is a time-intensive cycle that will repeat itself again and again. | As pipes, meters and valves reach the end of their lifespans, data can help utilities shift from reactive maintenance and replacements to proactive investments in infrastructure. The combination of **historical data, trends and up-to-the-minute metrics** help maximize returns and optimize processes. |



# OPERATIONAL EFFICIENCY AT THE EDGE

Leveraging utilities' existing assets with a roadmap for the future, we help boost operational efficiency across electric and natural gas distribution infrastructure and processes with a tailored selection of the following:

**Smart Meters and modules deliver real-time data to electric and gas utilities alike, advancing grid management for process- and network-wide efficiency improvements.**

- **Alpha® 4 EA** – With an array of efficiency-increasing features like expanded data gathering and processing power, this advanced electric meter is also compatible with older infrastructure and has the capacity to grow with future grid applications.
- **NXU Residential Smart Gas Meter** – In addition to its automatic shutoff valve, 20-year battery life and reduced mechanical wear that helps maintain meter functionality over sustained periods, the NXU smart meter is also a dual-form factor meter. It reads both 250 and 425 cubic feet of gas per hour, which means it eliminates the expenses and time associated with two different meters, truck rolls and training costs. It also maintains reliable reads *and* uptime while switching seamlessly between flow volumes.
- **NXCM Cellular Module** – Gas utilities can upfit their installed meter base and turn any existing meter into a smart meter, strategically modernizing networks with minimal downtime and costs. Unlocking automated reads and integrated data reveals crucial network insights.

**Honeywell Forge Performance+ for Utilities is a unified digital platform that helps support, monitor and manage critical assets across distribution networks.** As data is collected from disparate sources (meters, modules, valves, etc.), this software organizes all information into a cohesive, holistic view. It has five value-add applications to further efficiency from several operational angles:

- **AMI View** – From asset conditions to a referenceable knowledge base, utilities can make faster, more informed decisions with insightful analytics and self-service reporting.
- **GridScan** – Utilities can strengthen daily workflows with end-to-end asset visibility, automated analyses, power quality diagnostics and preventive alerts.
- **GridFin** – This business intelligence links cost drivers (peak demand) to cost-saving and reliability-increasing strategies (DERs and energy storage) through continuous monitoring of assets in a single dashboard.
- **Forecasts** – Improving accuracy for long-term system planning, this application predicts peak demands and enhances DER integration across the grid for greater control. It also detects behind-the meter DERs and evaluates their grid impact via data analysis over time.
- **Utility Data Hub** – Consolidating siloed data streams into one accessible platform, Utility Data Hub delivers ready-to-use insights to various utility departments.

**Connected utility services from cross-trained providers deliver agile support to help increase distribution asset reliability and efficiency.**

- We perform mass meter installation, exchange and maintenance, as well as inspections and testing for devices and communication networks. We also offer line locating for quality data capture and the digitalization of underground utility assets. This technology-as-a-service helps build a digital library of utility locates to keep utilities on-time and on-target during infrastructure assessments or projects.

**Utilities have a competitive advantage at the edge because Honeywell devices, software and services structure efficiency around actionable data and total visibility.**

# KEEP CYBER INTRUSIONS AWAY FROM INFRASTRUCTURE

3

> **It might seem counterintuitive, but the increased use of connected devices and smart technologies means cyberthreats advance in parallel. As utilities' newer systems merge with old ones to optimize operational efficiency and prioritize life safety, the widened attack surface on our grid creates more access points, and thus, more cyber vulnerabilities.**

One cyber incident immediately risks compliance with safety regulations, safe operating thresholds and costly downtime. Tampering and theft at the meter level, ransomware that gains remote access to resources and the exploitation of legacy systems the edge (and human error) all have the potential to create detrimental effects, which render basic cybersecurity standards and protocols ineffective.

Utilities need a complete cybersecurity solution — one that protects data, limits tampering in the field and evolves as threats do — instead of reactive add-ons. Here's how we help secure distribution operations from end to end using electric utilities as an example:

- **A4 Pro** – The A4 meter has magnetic tamper detection, motion detection and a secure 128-bit encryption to prevent unauthorized manipulation and data theft.
- **Next Gen Gatekeeper** – The meter's intelligent interface between the head-end system and the local area network has a secure enclosure and protected communication capabilities.
- **Connexo® NetSense** – This head-end system within advanced metering infrastructure helps protect load profiles and register reads through network segmentation. It also pushes necessary security updates to infrastructure over the air.
- **EnergyAxis** – As the meter collects data and transmits it to management platforms, this network is continuously hardened against cyber incidents with threat detection tools.
- **Honeywell Forge Performance+ for Utilities** – This digital platform includes predictive maintenance to increase threat-readiness of field assets, alarms for physical manipulation and monitoring of other metrics that signal intrusion.

### RISKS CAN BECOME REAL-WORLD PROBLEMS FOR MILLIONS

**Outages and Blackouts**
Cyberattacks can disrupt energy distribution and disable power during times of peak demand.

**Pressure Spikes**
Tampering and theft at the meter can result in abnormal, unsafe pressures within homes and businesses.

**Equipment Damage**
Physical manipulation of meters, pipelines and valves can permanently alter network function.

**Public Safety Threats**
Coordinated attacks can target hospitals, traffic lights and other critical, concentrated areas.

The convergence of encryptions, detection and threat defenses, instead of one-off features, best positions utilities to maintain reliability, public trust and uncompromised flows in an increasingly connected energy system. From homes to businesses to data centers, Honeywell helps keep utilities safe from cyberthreats.

# CONCLUSION

## It's hard to know what comes next in the energy landscape, but preparation now is essential.

Honeywell is the proven architect of future-ready utilities across North America. What we modernize today helps anticipate and adapt to tomorrow's demands at the distribution level. Integrating our deep domain expertise and industry-leading technologies within every meter, platform and network, we build upon existing foundations to help utilities operate safely, efficiently and securely at the edge, for generations to come.

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