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Assumption Inertia: The Hidden Accounting Risk in Utility Transition

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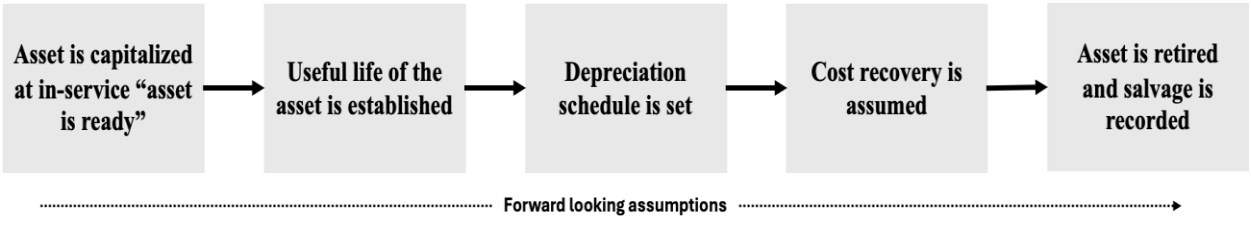
Abstract: A recent United States Federal Energy policy has stressed that high energy costs "devastate American consumers" by increasing the cost of "heating, utilities, farming, and manufacturing." [1] At a time when national policy rhetoric increasingly focuses on how energy costs affect households and industrial competitiveness, regulated utilities still lack a formal, repeatable mechanism to translate real-world asset performance, evolving economic conditions, and emerging policy trajectories back into core accounting assumptions. As a result, accounting treatments increasingly reflect historical expectations rather than current operational and regulatory reality. Key assumptions, particularly useful life, recoverability, and depreciation structure, become effectively frozen once established. They persist even as the conditions they were meant to represent change materially. Over time, this assumption inertia erodes the informational value of financial statements and concentrates risk rather than managing it. This structural lag becomes particularly acute in a transition environment. Asset utilization, policy direction, and economic usefulness can diverge significantly from accounting representations long before formal triggers force adjustment, resulting in deferred recognition and, ultimately, abrupt financial impacts. While advances in AI and analytics have largely eliminated historical data constraints and enabled far more forward-looking insight into asset performance and value, these signals remain largely excluded from accounting judgment due to governance gaps.This paper proposes a ***Performance-Informed Accounting Feedback Loop***; a governed process through which accounting assumptions are periodically revalidated, or explicitly reaffirmed, using observable operational, financial, and policy signals. The objective is not continuous remeasurement, but disciplined reassessment, transforming accounting from a passive recorder of outcomes into a more forward-looking risk management tool.

Keywords: *accounting, reassessment, triggers, reaffirmed*

Introduction: A One-Way Accounting Model in a Dynamic Asset Environment

In most utilities, the accounting lifecycle for long-lived assets remains fundamentally linear. An asset is capitalized at in-service, a useful life is established, a depreciation schedule is set, and cost recovery is assumed unless and until it is formally challenged [2]. This process embeds forward-looking assumptions at inception but provides no systematic mechanism to revisit them later. Critically, downstream developments rarely trigger structured accounting review. Changes in actual utilization or dispatch patterns, load erosion or customer flight, deferred maintenance, technology redundancy, and emerging policy direction may all affect an asset's economic role, but absent a formal impairment event, rate case, or regulatory disallowance, the original accounting treatment generally persists.

Figure 1: Accounting lifecycle for long lived assets



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This phenomenon, *assumption inertia*, is not the result of negligence; it is a feature of governance design. The system is optimized for stability, consistency, and administ rative control, not for responsiveness to changing evidence. In a stable

environmen t, that lag may be tolerated; in a transition environment, it becomes much harder to defend.

Why This Is Dangerous in a Transition Environment

Assumption inertia is manageable in slow-moving systems. It becomes hazardous when the world described by accounting assumptions begins to change faster than the assumptions themselves. The energy transition introduces several destabilizing dynamics that traditional accounting governance is poorly equipped to absorb.

First, asset utilization can change faster than depreciation schedules. Assets may remain technically used and useful while operating far below the utilization patterns implicit in their original service-life assumptions. Second, policy signals often precede regulatory rulings by years. Legislative mandates, agency roadmaps, decarbonization commitments, and affordability pressures can materially affect the plausibility of future recovery long before they appear in formal orders. Third, economic usefulness can diverge from accounting usefulness. Assets may remain in rate base and on the books even as their marginal economic contribution declines, their strategic role narrows, or their continued use becomes increasingly contested.

Without a feedback loop, risk accumulates silently. Accounting reports lag operational and policy reality, and adjustments eventually surface as discrete shocks such as impairment, accelerated depreciation, securitization, abandonment, or abrupt rate impacts. The result is often described as conservative accounting, but it is better understood as deferred recognition of risk.

Against this backdrop, industry discussions often rely on a familiar framing; that accounting should reflect regulatory outcomes, not operational signals. This perspective has shaped both how current processes are defended and how their limitations are understood. However, this framing deserves closer examination, as detailed in the section below.

What the Process and the Industry Gets Wrong

Utilities frequently defend the current structure with the argument that accounting should reflect regulatory outcomes, not operational speculation. The argument is intuitive, but incomplete. Accounting already reflects forward-looking judgment. The difference is that it embeds that judgment once, usually at capitalization or at an initial depreciation study, and then often stops revisiting it.

Useful life determinations, depreciation structures, capitalization decisions, salvage assumptions, and recovery expectations are inherently predictive [3]. They rely on expectations about future utilization, investment behavior, regulatory continuity, and economic relevance. Pretending that these assumptions are purely objective does not make accounting less speculative; it merely obscures the fact that its forward-looking judgments have become stale.

The real issue, then, is not whether accounting would become speculative under a feedback model. It is that accounting already contains speculation, but without a disciplined mechanism to update that speculation as observable evidence changes. Once that is acknowledged, the relevant question is no longer whether accounting should remain insulated from operational insight. It is whether the current model remains credible in an environment where the quality of operational insight has changed fundamentally.

The Technology Gap Is Closed. The Governance Gap Is Not

A critical but underappreciated shift has occurred over the last decade. Utilities increasingly generate forward-looking signals about asset condition, utilization, replacement economics, and project viability, yet those signals typically remain trapped within engineering, operations, portfolio management, or work management processes. Accounting often sees the consequences only after they have become formal events.

The limiting factor, in other words, is no longer the absence of relevant data. It is whether that information is systematically translated into accounting judgment. The implications of this shift become clearer in the sections below, which highlight not only the performance signals utilities now routinely generate but also how operational and investment decisions increasingly reflect changing asset value, signals that accounting frameworks continue to overlook or fail to incorporate.

Asset Management: The Performance Signals Accounting Still Ignores

Utilities now possess far more granular, timely, and predictive insight into asset performance than when many current accounting conventions were designed. Asset performance management, condition monitoring, investment re-evaluation, scenario analysis, portfolio optimization, and variance analysis are increasingly normal features of modern utility asset governance rather than experimental capabilities.

Modern utilities increasingly deploy predictive maintenance models, sensor-level condition monitoring, real-time telemetry, failure probability scoring, and scenario-based utilization forecasting tied to load projections and system needs [4]. These tools do more than explain what has already happened. They produce probability-based insight into how long assets are likely to remain economically useful, how reliably they will perform, how failure risk changes under different operating conditions, and whether continued investment still creates value.

In effect, utilities now routinely analyze many of the same factors accounting assumptions are supposed to reflect. The problem is not that the organization lacks a view of asset economics. The problem is that this view rarely enters formal accounting review unless it is forced there by an external event. That disconnect is increasingly difficult to justify.

Work Management: Where Operational Reality Gets Ahead of Assumptions

With the application of advanced analytics, work management no longer operates only as a reactive scheduling function. It increasingly becomes a window into management's evolving economic judgment about an asset. Analytics-enabled planning allows utilities to prioritize maintenance, capital, and refurbishment activity based on changing condition, failure risk, operational role, and expected value contribution.

As a result, work management data often surfaces signals of economic intent before any accounting trigger appears. These signals may include repeated deferral of non-safety maintenance, reclassification of work from capital enhancement to sustaining activity, movement from performance optimization toward risk mitigation, declining reinvestment relative to original plans, or increased reliance on corrective maintenance rather than systematic renewal. Collectively, these patterns can indicate that an asset is being managed as a lower-value or transitional resource even if it remains technically in service.

Yet these signals rarely trigger structured reassessment of accounting assumptions. Useful life, depreciation method, recoverability assumptions, and related treatments often remain unchanged even when the organization's own stewardship behavior suggests that the original economic narrative no longer holds. The result is a growing disconnect between how assets are managed and how they are represented financially.

Historically, utilities could defend this gap by arguing that performance insight was limited, fragmented, qualitative, and too operationally contingent to support disciplined accounting judgment. That defense is far less persuasive today. Current capabilities support much more dynamic, evidence-based assessment of asset condition, performance, and economic relevance. If the informational barrier has largely been removed, then the remaining barrier is structural.

The Structural Gap in Translating Insight into Accounting Judgment

Although useful life, recoverability, and depreciation timing are the most visible assumptions affected by this structural lag, they are only part of the problem. The absence of a feedback loop affects a much broader set of accounting treatments that depend on expectations about the future. Capitalization versus expense, substantial betterment, retirement identification, salvage, cost of removal, depreciation methods, and the timing of asset retirement obligations all depend, in one form or another, on judgments about how long assets will remain relevant, how they are being managed, and whether future investment in them continues to be justified.

Depreciation: The Scope of the Problem Is Broader Than Useful Life Alone

The most obvious consequence of changing performance insight is pressure on estimated useful life, but the implications do not stop there. Advanced analytics also challenge the continued appropriateness of depreciation method and asset grouping.

Traditional utility depreciation relies heavily on averages [5]. Assets are pooled into classes, average

service lives are estimated, and costs are allocated using methods that assume a tolerable and relatively stable dispersion around those averages. That framework was practical when utilities lacked granular visibility into differentiated asset behavior. It becomes more fragile when the enterprise can now observe which assets or subpopulations are materially underutilized, strategically deprioritized, more failure-prone, or consumed on patterns that differ significantly from the broader class.

Internal utility accounting guidance explicitly addresses individual depreciation, group depreciation, normal versus abnormal retirements, and decommissioning as connected accounting questions rather than separate topics. That linkage is important. If performance data show that assets within the same accounting group no longer share a coherent economic profile, then the issue is not only whether the life estimate is wrong. It is whether the existing unit of account and depreciation pattern still represent how value is actually being realized. A performance-informed model does not require continuous asset-by-asset depreciation remeasurement. But it does require the ability to recognize when existing grouping assumptions and depreciation methods have become stale enough to warrant review.

Capitalization: Betterment, and Sustaining Work Require Reassessment

The same logic applies to the distinction between capital and expense. In practice, this determination is rarely a purely mechanical policy test. It is a judgment about whether an expenditure merely preserves current condition or instead creates future benefit by increasing life, usefulness, capacity, or efficiency. Existing capitalization policies formalize this directly. They define substantial additions and substantial betterments by reference to whether work extends useful life, improves durability, enhances efficiency, or expands capacity beyond baseline performance, often with required third-party or internal engineering support.

Advanced analytics materially sharpen that judgment. Work order patterns, condition trajectories, and intervention outcomes can help distinguish between expenditures that genuinely enhance future performance and those that simply sustain declining assets long enough to manage reliability, safety, or compliance risk. That distinction becomes more important in a transition environment, where organizations may continue investing in legacy assets but for fundamentally different reasons than those embedded in older capital policy assumptions.

An expenditure that once would have been viewed as a life-extending investment may increasingly function as a temporary sustaining measure for an asset whose strategic role is narrowing. Without a feedback loop, accounting treatment can lag this shift in management intent. Costs may continue to be characterized as though the asset remains on its original economic trajectory, even when stewardship behavior suggests otherwise.

Asset Retirement Obligations: Judgments Should Not Remain Static

The feedback-loop problem extends beyond plant-in-service accounting to liability judgments, particularly asset retirement obligations (AROs) [6]. These obligations are typically framed as legal constructs arising from statutory or contractual requirements to retire a long-lived asset. As a result, they are often treated as analytically separate from asset performance.

However, while recognition of an ARO is anchored in legal obligation, its measurement is inherently forward-looking. Estimation requires assumptions about the timing of retirement, expected settlement costs, and the period over which the obligation will be fulfilled. These inputs depend on expectations about how long the asset will remain in service and how it will ultimately be retired. Even within accounting guidance, settlement may occur during operation or after use ends and can unfold over time rather than as a single event.

This creates a direct, though often unacknowledged, linkage between ARO assumptions and the same operational and economic signals that affect asset value. When expected asset lives shorten, operating roles narrow, or transition pathways accelerate, the timing and profile of the associated retirement obligation may change. Yet in practice, ARO assumptions are more commonly revisited through periodic engineering or regulatory reviews than through systematic incorporation of evolving performance and planning insights.

In a transition environment, this lag becomes more consequential. Earlier or more uncertain retirement expectations can affect both the timing and magnitude of ARO settlement, influencing the pattern of liability accretion over time. If these developments are not incorporated until late-stage

triggers, the liability can lag underlying asset reality in the same way as depreciation and recoverability assumptions.

It is important to distinguish recognition from measurement. The existence of a legal obligation does not change with asset performance, but the assumptions used to measure that obligation do. Absent a structured mechanism to revisit those assumptions as evidence evolves, AROs exhibit the same form of assumption inertia observed elsewhere in the accounting model.

A performance-informed framework does not imply continuous remeasurement. It does, however, require that material changes in expected asset life, operating role, or retirement pathway be considered relevant triggers for reassessing ARO assumptions. Extending the feedback loop to these judgments ensures that liability measurement evolves in step with asset realities, rather than reacting only after retirement becomes formal or unavoidable.

How should these insights be incorporated into financial decision-making? What is missing is not additional data, but a formal mechanism to translate evolving performance signals into disciplined accounting judgment.

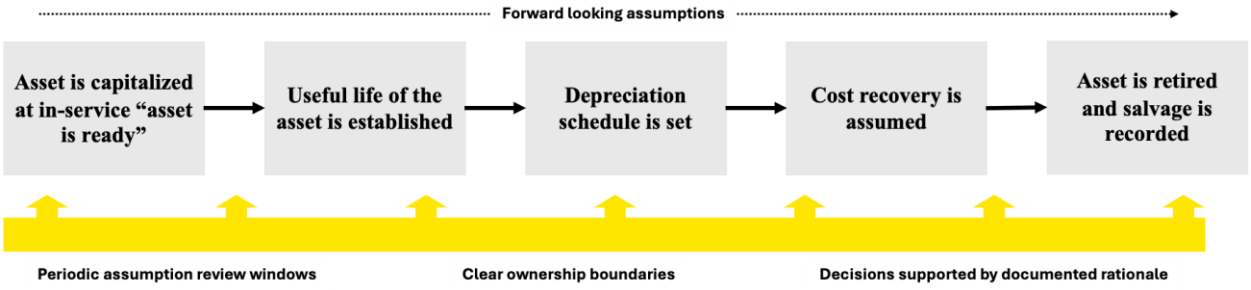
Performance-Informed Accounting as the Missing Layer

What is missing, therefore, is not simply a periodic challenge to assumptions. What is missing is an institutional translation layer between modern analytics and financial reporting: a governed mechanism that determines when evolving operational evidence is sufficiently significant to require reassessment across the broader accounting model.

The Performance-Informed Accounting framework should be understood as that missing layer. It does not require utilities to invent entirely new data systems. It requires utilities to recognize AI-derived and analytics-based insight as relevant accounting evidence, define how probabilistic and forward-looking operational information should inform judgment, and establish governance pathways through which operational signals can trigger financial review [7].

In practice, this feedback loop would begin with accounting assumptions that are initially set using forward-looking judgment. It would include ongoing assessment of asset performance and external conditions. It would also incorporate periodic assumption review windows aligned with planning cycles, rather than triggered only on an ad hoc basis. Clear ownership boundaries would exist among accounting, finance, work and asset management, and regulatory affairs [8]. Finally, decisions would be supported by documented rationale, both when assumptions remain unchanged despite identified signals and when they are adjusted based on defined review thresholds.

Figure 3: Performance-Informed Accounting Framework



Such a framework serves two purposes. Internally, it strengthens risk recognition by ensuring that evolving asset realities are surfaced and evaluated before they culminate in abrupt financial outcomes. Externally, it helps protect utilities from accusations of opportunism, retroactive justification, or earnings management by grounding accounting decisions in a documented, repeatable process rather than in episodic, crisis-driven intervention.

Importantly, the framework does not suggest that AI outputs should determine accounting outcomes on their own. Analytics would not replace accounting judgment, regulatory interpretation, or audit discipline. Rather, they would prompt review, inform professional judgment, and strengthen documentation. Accounting remains a human, governance-based function. The argument is simply that it should be informed by the organization's growing analytical understanding of asset economics rather than insulated from it.

Conclusion

In a period of accelerating transition, stability can no longer be achieved merely by holding assumptions fixed [9]. It must be earned through disciplined reassessment. Performance-Informed Accounting does not weaken the regulatory compact by introducing discretionary cost recovery or uncontrolled remeasurement. It strengthens that compact by modernizing the governance mechanisms that support long-term credibility, affordability, and capital access.

By introducing a structured feedback loop, performance-informed accounting changes how utilities experience and manage transition risk. It transforms accounting from a lagging indicator into a more effective early-warning mechanism, distributes financial adjustments over time to reduce the likelihood of abrupt shocks, and lowers the risk of adversarial, crisis-driven regulatory intervention. It improves the alignment between how assets are managed, how risks are understood, and how those assets are represented in financial reporting.

Most importantly, this approach responds to a reality the industry can no longer plausibly avoid; the organization often already knows more about the changing economics of its assets than its accounting reflects. In a capital-intensive, politically mediated industry, credibility and foresight are themselves financial assets. A disciplined, performance-informed feedback loop is how both are sustained.

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