Reaching for the Cloud:

Solutions for Regulatory Parity for Cloud Services for Utilities

Edison Electric INSTITUTE

ADVANCED ENERGY ECONOMY

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Solutions for Regulatory Parity for Cloud Services for Utilities

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Executive Summary

Information technology (IT) and data solutions are a central focus of modern enterprise in every industry. Recognizing this central importance, many industries have shifted from traditional, on-premises IT solutions to cloud computing when there have been opportunities to benefit from its scalability, flexibility, and efficient use of capacity.

This migration has caused a shift in IT strategy and the options available to increase efficiency and improve operations. Cloud computing may be deployed through a variety of service and ownership models; and it can allow businesses to meet their IT needs in a more cost-effective manner and with less internal effort, leaving more resources to devote to core business activities. Cloud computing can also minimize certain financial and operational risks to enterprise companies, provide greater protection against cyber-attacks, and ensure better resilience during disasters. Cloud services are also substantially more energy efficient than on-premises systems and can play a central role in corporate strategies to reduce carbon emissions.

Yet, the regulated utility industry is one in which the transition to cloud computing has been slow as a result of traditional utility regulation. Traditional regulation favors long-term, upfront capital investments, which are recovered in rates over a long period of time keeping the rates stable for customers and generating a rate of return (e.g., on-premises IT systems). In contrast cloud solutions, which are periodic costs with a short-term benefit and typically receive no rate of return, are not favored under traditional regulation despite the fact that this technology performs the same duty and function as on-premises IT systems. When cloud computing solutions are classified as an operational expense, they increase operating expenditures, making it more difficult to manage costs efficiently and retain savings from reductions in operating expenditures. Likewise, operating savings generally do not generate any direct returns, unlike the on-premises solutions they are replacing. As a result, this methodology ignores many of the long-term benefits that cloud solutions and data investments could provide to utilities and their customers.

Alignment of utility and customer interests is an essential part of the regulatory compact and resolving this regulatory-induced conflict will produce more positive outcomes for customers and utilities by supporting the capabilities needed to enhance grid reliability, integrate an increasing renewable power mix, and managing cybersecurity all while maintaining affordable energy access for customers.

As with many issues in the regulatory environment there is an accounting perspective that must be reconciled. As it stands today, regulatory accounting for cloud-based and on-premises solutions is inconsistent. While this report uses rather broad definitions of cloud computing and on-premises systems, accounting systems are much more specific and break out individual costs based on specific functions. Generally Accepted Accounting Principles (GAAP), a standardized set of accounting rules and processes that all regulated utilities, including electric, gas, and water must utilize, allow for capitalization of software, implementation, and hardware costs associated with an on-premises solutions. However, for cloud-based solutions, only the initial costs of implementing the solution currently qualify for capitalization, whereas the larger costs of the solution itself (such as hosting and, in most cases, software) do not qualify. Instead, those costs are expensed as the service is rendered.

This paper examines various options to capture the benefits that can be realized by greater use of cloud-based solutions and the regulatory treatment needed to level the playing field between cloud-based and on-premises solutions. These options will help to support a merit-based evaluation of solutions focused on providing benefit to customers. Some in the industry have pointed to a 2018

update to GAAP accounting that allows for the capitalization of implementation costs associated with deploying cloud solutions as a resolution to the unequal treatment of cloud-based and on-premises solutions. While the update is helpful, it was largely adopted to address consistency in accounting for non-utility companies and does not address how the issue interacts with utility regulation or whether the cost of the cloud solution itself (rather than costs associated with the implementation of the solution) should be capitalized. Fortunately, there are regulatory options that can help address the disincentives that exist to adopting cloud solutions, which are discussed further in this paper. While each option has its benefits and drawbacks, they should be evaluated by two basic criteria:

- Does the mechanism provide equal financial outcomes for cloud solutions compared to what the utility would achieve were it to invest in an on-premises solution; and
- Does it preserve the flexibility of the cloud solution so the utility can adjust usage and have payments reflect these changes accordingly?

The options, which are explained in further detail in this paper, are to:

- Prepay for cloud solutions and amortize the prepayment in the same manner as an upfront investment in an on-premises system or other plant in-service. While this method provides similar financial outcomes to an on-premises system, it limits the flexibility of cloud solutions and introduces risk associated with needing to predict needs years in advance.
- Pay for costs periodically over time commensurate with cloud usage and amortize each payment from the point the cost is incurred to the end data of the cloud service. This avoids the need to predict cloud needs far in the future preserving the flexibility of cloud computing, but the method also reduces return relative to the prepayment method or an on-premises system of the same cost due to the shortened amortization period for payments made closer to the end date of the service.
- Combine the two approaches discussed above to balance the strengths and weaknesses of each. A utility could use a prepayment for a minimum expected usage level and then pay for additional usage as needed with periodic payments. That approach may provide the necessary flexibility while keeping financial impact closer to what would be experienced with an on-premises system.
- Provide a modest adder to the recovery of cloud computing expenses and retain common operating expense treatment for cloud solutions. This adder would attempt to replace the opportunity cost associated with choosing cloud over an on-premises system. This option would retain the full flexibility of cloud-based solutions and would be relatively easy to implement in terms of accounting.

Each of the options identified in this paper rests on clear accounting rules in GAAP that recognize the authority and prerogative of regulators to create regulatory assets and modify the financial impact of certain actions in order to achieve policy goals. Therefore, any of the options discussed above would be consistent with existing state authority and national accounting principles.

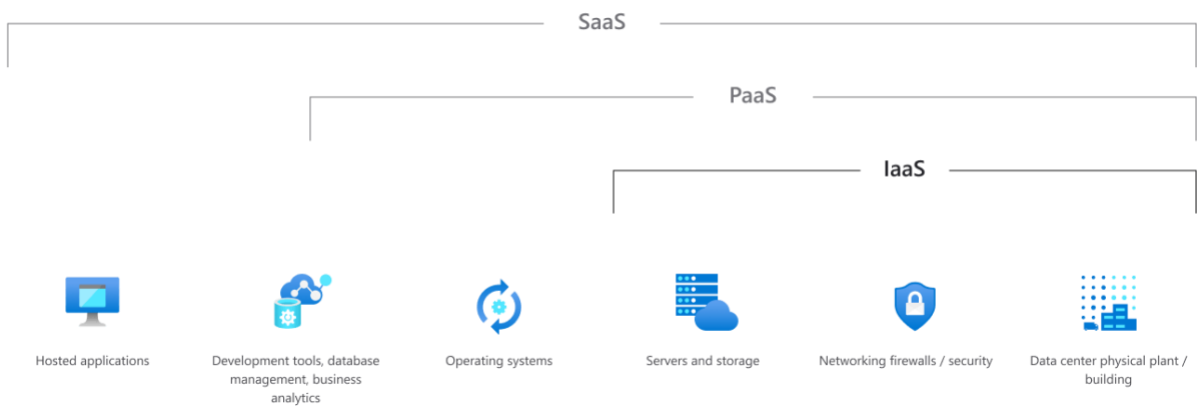
Cloud Computing Definition and Benefits

Cloud computing is a means of sharing the capacity of IT infrastructure to more efficiently provide a wide array of IT-related functions that is quickly replacing traditional self-built and managed on-premises IT infrastructure.[1] For leading industries, the shift from on-premises systems to cloud computing is at an advanced stage, with cloud computing serving as the foundation for enterprise computing that is valued for its ability to support accelerated speed to market, meet stringent cybersecurity compliance requirements, enable scale, and provide flexibility to expand and contract as business needs shift.

In contrast, for regulated utilities, the transition to widespread use of cloud computing is progressing at a relatively slow pace. The reasons for the slow transition, that aforementioned regulatory paradigm, and options to address them, are the primary topic of this paper. This section provides a foundation to describe what cloud computing is and how utility customers will lose out if these barriers persist and utilities are unable to harness the benefits of cloud computing like other industries. A table at the end of this section summarizes the relative costs and benefits of cloud computing and on-premises solutions.

Cloud computing comes in many different types of deployments, but a key feature is the pooling and sharing of computing infrastructure to provide more flexible and scalable capacity and to allow for more efficient use of capacity. This allows cloud providers to offer IT infrastructure “on-demand” while saving on infrastructure costs compared to building physical IT capacity specifically for each customer. Cloud computing can simply consist of hosted hardware to run a company’s own operating system and software (known as Infrastructure-as-a-Service). It can also provide an operating environment and software to run specific applications (Platform-as-a-Service) or provide the application directly without the customer needing to manage the software on any substantial level (Software-as-a-Service). Some cloud deployments for large enterprises can be privately-owned (allowing the company to share computing capacity but only internally) while other hybrid deployments can consist of cloud and on-premises systems working together. The private clouds owned by a company do not support accelerated scaling or ramp downs—they are similar to on-premises systems in terms of efficiency, cost, security, and operations—and are treated as capital assets just like on-premises systems. Rather, the financial and accounting issues that are the focus of this paper are germane to the provision of cloud as a service rather than a utility-owned asset. Accordingly, this paper will primarily focus on public cloud services.

[1] The National Institute of Standards and Technology provides a much more detailed definition of cloud computing. An excerpt reads: “Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models. The full definition is available at: https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf



Source: Used with permission from Microsoft[2]

Using cloud-based services may allow businesses to meet their IT needs in a more cost-effective manner and with less internal effort, leaving them greater capacity and resources to focus on their core activities. IT is a critical element that is engaged in supporting almost all business functions but, for most companies, IT is a means for providing products and services, not the core skillset of its workforce or business strategy. As a result, it makes sense that most businesses specialize on their own operations, customer services, and strategy, rather than become IT specialists in their own right. Cloud providers are no different; they have deep specialization in what they do and must continually improve their offerings in terms of cost and functionality to compete in today's market. Cloud computing provides specialization and efficiency that is out of reach for most companies acting on their own and instead allows companies to devote more resources to their core activities and focus on driving business outcomes from IT investments.

Cloud computing can also minimize a number of financial and operational risks relative to on-premises solutions. On-premises systems require companies to make multi-year planning and purchase decisions based on forecasted peak usage for their IT systems. This can result in over or underbuilding systems, resulting in potential operational bottlenecks for utilities or unnecessary costs for their customers. A company may also want to try a service on a provisional basis or decide to cancel an IT application that is not delivering services as planned. This would result in stranded assets[3] if on-premises systems were used, but not in the case of cloud services, which can typically be canceled without ongoing payments paid for by customers.

Cloud services can be more resilient during disasters, as they can be co-located in geographically distant locations from a customer's premises that will not be simultaneously affected by earthquakes, or other severe weather events like hurricanes or wildfires. On-premises systems cannot achieve the same level of resilience.

Finally, cloud providers make significant investments in cybersecurity to ensure that the systems are highly resistant to intrusion. The scale of large cloud providers can enable early detection of cybersecurity threats and accelerated threat response. The Federal Government has vetted several cloud computing services and relies on them for mission critical services.[4]

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[2] Source website: https://azure.microsoft.com/en-us/overview/what-is-iaas/#overview

[3] An asset that has been rendered either partly or fully unused due to a change in circumstances prior to the end of its expected useful life.

[4] For example, see the U.S. General Services Administration FedRAMP approvals list: GSA Announces FedRAMP High Baseline Requirements

In addition to performance and features, cloud providers compete based on their efficiency and ability to minimize carbon emissions. For providers, it is both a way to offer better prices to customers and to fulfill corporate commitments to minimize the impact of their operations on the environment. This has led to large investments in energy efficiency, from the buildings that house the data centers all the way down to custom processor designs.[5] In a 2020 study, the International Energy Agency found that since 2010, data center energy use remained constant even as workloads increased 8 times and internet traffic increased 12 times.[6] In another study published in the journal *Science*, data center efficiency was seen to improve 20 percent per year since 2010—although computation power has gone up 550 percent in the last decade, the industry's energy usage has only climbed 6 percent.[7] Additionally, Microsoft commissioned an in-depth analysis of the energy efficiency and carbon emissions of cloud computing compared to enterprise on-premises systems taking into account the full lifecycle of each type of system, starting at extracting the raw materials for components to end-of-life disposal. The study found that, depending on the workload, cloud was 22-93 percent more efficient than on-premises systems when energy use alone was considered, and that life-cycle carbon emissions were 72-98 percent less when cloud is powered with renewable energy.[8] An Accenture report estimates that a faster migration to cloud computing will result in carbon reductions that are equivalent to removing 22 million cars from the road.[9]

[5] AWS, Google, Microsoft, and Oracle have all developed custom-designed chips to run more efficiently in their cloud computing environments.

[6] International Energy Agency, *Data Centres and Data Transmission Networks*, June 2020. Available at: https://www.iea.org/reports/data-centres-and-data-transmission-networks

[7] Eric Masanet, Arman Shehabi, Nuoa Lei, Sarah Smith, Jonathan Koomey, *Recalibrating Global Data Center Energy-Use Estimates*, SCIENCE, Vol. 367, Issue 6481, February 28, 2020. Available at: https://www.science.org/doi/10.1126/science.aba3758

[8] Microsoft Cloud and WSP, *The Carbon Benefits of Cloud Computing*, 2020, p. 12. Available at: https://azure.microsoft.com/en-us/global-infrastructure/sustainability/#carbon-benefits

[9] Accenture, *The Green Behind the Cloud*, 2020, p. 3. Available at: https://www.accenture.com/_acnmedia/PDF-135/Accenture-Strategy-Green-Behind-Cloud-POV.pdf#zoom=40

A Comparison of On-Premises Systems and Cloud Computing Services

	On-Premises	Cloud Services
Cost	Typically, less cost-efficient than cloud due to the inability to efficiently share capacity and higher lifecycle cost of operations. Systems have higher energy costs, higher risk of stranded assets, and large lump-sum costs during deployment and upgrades.	Public cloud services total cost of ownership is up to 40 percent less than on-premises systems.[10] Costs are spread over the lifetime of the solution and vary with usage.
Planning/Flexibility	Capacity must be planned and built well in advance. Capacity can only be added. Capital costs are fixed, regardless of usage.	Minimal advance planning required. Capacity can be increased/decreased on demand. Billing can be based on actual usage. Enables fast response to changing customer and energy grid needs. Reduces time from investment to outcomes.
Features/Updates	Maintenance updates are security and stability focused and require in-house staff to manage updates. New features are added more slowly and less frequently.	Maintenance updates are applied automatically. New features are deployed frequently and consistently. Agile approach leads to faster adoption of new features, and better functionality for both companies and customers.
Cybersecurity	Depends on investment/skill of system operator. Cybersecurity resources devoted to on-premises systems are inherently limited to the scale of one company.	Platforms and software secured by industry-leading cybersecurity teams. Cloud providers can devote significant resources to cybersecurity.
Connectivity	Lower connectivity requirements.	High-speed, reliable data connections required. Connectivity can be through public networks (secured with encryption) or through dedicated and private networks.
Reliability	IT frequently called upon to wear many hats. Attention is split between device, data, network, and infrastructure management.	Dedicated and specialized teams keep systems running reliably and efficiently.
Disaster Resilience	Can be affected by a natural or other disaster. Restoration times can be days, not hours.	Co-located in separate locations that do not share the same risks. Minimizes threats from a single disaster.
Sustainability	On-premises deployments will not have access to the latest systems for efficiently powering and cooling data centers.	Highly specialized and efficient systems for powering and cooling data centers. Many providers only power their systems with renewable energy. Carbon reductions of 72-98 percent.[11]

[10] Ibid., p. 4.

[11] The Carbon Benefits of Cloud Computing, p. 12.

Traditional Regulation Misaligns Interests on Cloud Computing

While most companies achieve benefits in operational performance through greater use of cloud computing, under traditional regulation, putting aside the impact on customer bills, utilities generally do not receive a return when choosing a cloud solution over an on-premises IT solution. The reason for this arises from the way utilities are regulated. Cost-of-Service regulation is intended to encourage infrastructure investment by utilities by allowing them to earn a reasonable rate of return on capital investments. However, in cases where a need can be met with either a long-term investment of capital or a short-term operational expenditure, this traditional regulatory model has historically favored the capital investment over the operational expenditures, which are recovered without that same opportunity. This difference sometimes complicates utility efforts to transition from on-premises systems to cloud-based and hybrid solutions.

While every state implements regulation in different ways, the rates charged to customers and the overall revenue requirement for the utility are typically set in rate cases and other regulatory proceedings, where regulators and intervenors scrutinize utility plans and operations in a public, adjudicated process to ensure that the costs included in a utility's revenue requirement reflect prudent operations.

Included within the costs of running the utility are the costs of obtaining capital to invest in long-term infrastructure, such as poles, wires, transformers, and IT systems. Utilities pay for these systems upfront using capital invested from shareholders and borrowed from bondholders and other lenders. These funds are paid back through customer rates, usually over a long period of time that matches the expected useful life of the infrastructure. This stabilizes customer bills and addresses potential equity issues among customers over time. Utilities must also provide competitive rates of return for shareholder equity (commensurate with the risk profile of utilities relative to other investments) and competitive interest rates to lenders in order to have continued access to capital. The long repayment periods for the upfront utility investment in assets provides stable utility rates over time and prevents current customers from shouldering the full costs of long-term investments that they may not use in the future (such as if a customer moves away).

In contrast, operating expenditures pay for recurring costs and for items with short-term benefit such as fuel, salaries, maintenance, and leases. These are relatively steady costs that are not lump-sum investments like infrastructure, and so they do not require long-term carrying costs (interest on debt and the cost of equity) like capital investments do. Utility rates are generally assumed to cover operating expenses quickly, and so there is no rate of return on these expenses.[12] However, if there is an unexpected increase in operating expenses, such as for a cloud computing solution, it can result in a utility spending more relative to the revenue it receives in rates, resulting in adverse financial outcomes.

In the case of cloud computing, most associated costs are considered operating expenses since they are recurring, and the customer pays for a defined short-term period (use of the cloud service over the period the payment relates to). For on-premises IT systems, the largest costs are for long-term assets, such as hardware and multi-year software licenses, that require upfront investment that is recovered

[12] Regulation does generally assume that utilities will need some working capital provided by shareholders and banks to cover the gap in time between when costs are incurred, and expenses are recovered through incoming rate revenue. That working capital is meant to cover cashflow needs during that short period (typically 45 days), and the working capital does earn a small rate of return.

over time, just like other long-term utility assets. Under the traditional regulatory framework, cloud computing solutions, therefore, do not generate any direct return for utilities, whereas the on-premises systems they replace do.

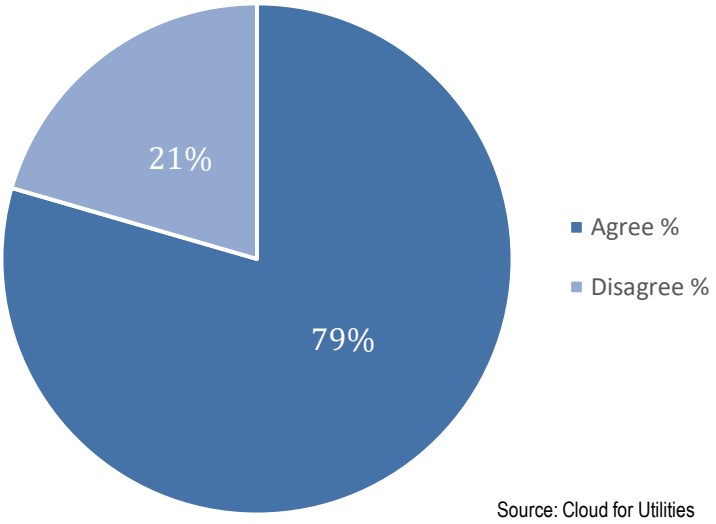
While intellectually, the investment in cloud computing is for a defined short-term period, in reality, once a company decides to go down the path of investing in cloud computing, it becomes an extremely difficult task for the company to revert back to an on-premises computing model. In practice, cloud computing is a long-term investment and hence should be given the same recognition and capital treatment that is given to on-premises investments in computing infrastructure.

A recent survey by Cloud for Utilities found that 79 percent of investor-owned utilities believe that the disparity in regulatory treatment is impeding the adoption of cloud computing (see chart below).[13] Furthermore, large cloud computing solutions can substantially increase operating expenditures compared to their on-premises counterparts which can lead to short-term under earning and long-term customer affordability concerns. The National Association of Regulatory Utility Commissioners (NARUC) recognized this conundrum and in 2016, adopted a resolution encouraging state regulators to consider whether cloud computing and on-premises systems should receive similar regulatory accounting treatment.[14] The appendix also highlights how some states have addressed the accounting treatment of costs associated with cloud computing. Despite this progress and recognition that cloud computing should receive similar treatment as traditional IT solutions, action on NARUCs resolution has been slow; therefore, utility adoption of cloud computing is still relatively low on an industry basis. As utility IT needs grow and become a critical part of customer engagement, renewable energy integration, and system management and operations, a shift from on-premises systems to cloud computing represents a potentially large decrease in capital expenditures for the utility industry that will only grow over time.

[13] Data provided by Cloud for Utilities February 2021 survey with 39 investor-owned utilities responding. Survey available upon request from Cloud for Utilities: https://cloudforutilities.org/

[14] National Association of Regulatory Utility Commissioners, Resolution Encouraging State Utility Commissions to Consider Improving the Regulatory Treatment of Cloud Computing Arrangements, adopted November 16, 2016. Available at: https://pubs.naruc.org/pub.cfm?id=2E54C6FF-FEE9-5368-21AB-638C00554476

My utility would invest in cloud applications at a faster rate if we were clearly allowed to earn a rate of return by our regulator



Source: Cloud for Utilities

Of course, the loss in business opportunity is not the only consideration for utilities when they decide how to best meet their IT needs. Utilities also have to deal with the fact that more and more software vendors are only providing software that operates within a cloud environment.

This regulatory-induced conflict serves neither customers nor utilities. Resolving the outdated regulatory conflict so that it allows utilities to be successful businesses while continuing to work in the public's best interest will produce more consistent positive outcomes and benefits for both utilities and their customers.

Accounting Treatment of Cloud Computing Is Inconsistent

To allow for simpler explanations of the regulatory options identified in the next section, this section provides a baseline understanding of utility accounting. This section also discusses recent changes to accounting rules that impact cloud computing and whether those changes are relevant to the regulatory barriers at the heart of this paper.

There are several types of accounting systems utilized by regulated entities, two of which are Generally Accepted Accounting Principles (GAAP) and the Federal Energy Regulatory Commission's (FERC) or NARUC's Uniform System of Accounts (USoA). GAAP is a series of rules relating to the standardized treatment of revenues, expenses, and assets, which are developed by the Financial Accounting Standards Board (FASB).[15] GAAP standards are utilized by public, private, and not-for-profit organizations, including utilities. USoA establishes standardized regulatory accounting and financial reporting requirements for FERC jurisdictional entities and promotes consistent and transparent information for decision-making.[16] In general, GAAP provides transparency and accountability for investors, creditors, and other financial stakeholders, while USoA provides the necessary data to inform ratemaking and other regulatory actions. Though similarities between GAAP and USoA do exist, as they serve different purposes, they differ in several ways. However, this paper only focuses on differences that are relevant to the treatment of cloud computing and on-premises systems.

While this paper uses a broad definition of cloud computing and on-premises IT systems, accounting systems are much more specific and break out individual costs based on specific functions. GAAP provides specific guidance for all entities regarding the accounting for internal-use software (defined below), whether purchased outright (i.e., on-premises software) or acquired as part of a cloud computing arrangement (i.e., hosting arrangement).

The accounting for internal-use software via a hosting arrangement (such as running internal-use software on cloud infrastructure) is identical to the accounting for other internal-use software used on-premises and is capitalized as an asset if <u>both</u> of the following criteria are met:

- The customer has the contractual right to take possession of the software at any time during the hosting period without significant penalty; and,
- It is feasible for the customer to either run the software on its own hardware or contract with another party, unrelated to the [software] vendor, to host the software."[17]

If both criteria have not been met, the customer has not acquired an asset, but instead has arranged for a service to be provided by the vendor. The hosting arrangement does not constitute a purchase of, or convey a license to, software and is therefore considered a service contract. Accordingly, the fees paid for a service contract are expensed as the services are provided during the contract period. Software-

[15] National Association of Regulatory Utility Commissioners, *Regulatory Accounting: A Primer for Utility Regulators*, December 2019, p. 5. Available at: https://pubs.naruc.org/pub.cfm?id=EE6402E5-155D-0A36-31F8-36FEBB6D4E44

[16] Federal Energy Regulatory Commission, *Accounting Matters*, updated March 2021. Available at: https://www.ferc.gov/enforcement-legal/enforcement/accounting-matters

[17] Financial Accounting Standards Board, *Accounting Standards Update No. 2018-15,* August 2018. Available at: https://asc.fasb.org/imageRoot/22/118236022.pdf

as-a-Service, where the use of the software and hosting are provided together and cannot be separated, often falls into this category. If both criteria are met, the software license is capitalized following the same guidance as on-premises software.

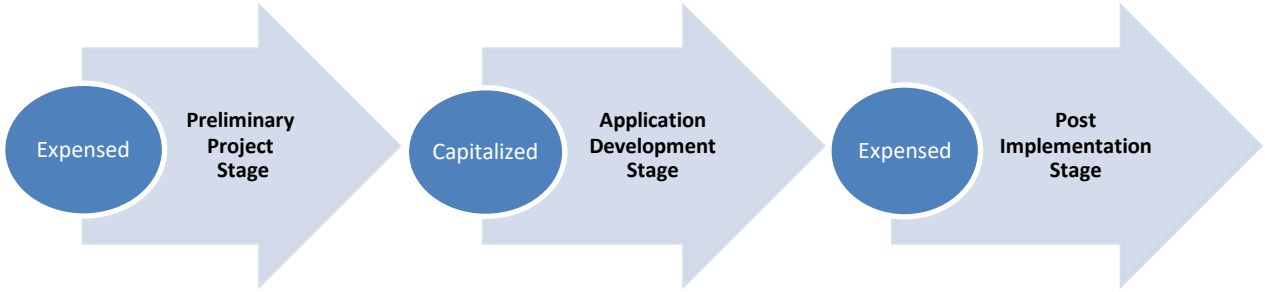
GAAP also provides specific guidance regarding the accounting for IT system implementation costs. Prior to the issuance of Accounting Standards Update (ASU) 2018-15 in 2018, there were different practices for the accounting for costs incurred to implement a hosting arrangement for software without an internal-use license (such as for SaaS). ASU 2018-15 aligned the accounting requirements for the implementation costs of hosting arrangements with those of on-premises and internal-use software. The update did not affect the accounting for the hosting fees paid to a vendor for a hosting arrangement, but instead, only applies to implementation costs. In other words, the update only provided equivalent treatment for implementation costs for cloud solutions compared to what was already available for on-premises or internal-use software, but did not go any further in resolving accounting disparities. Capitalized implementation costs for hosting arrangements that are service contracts are presented in the same line item in the statement of financial position that a prepayment of hosting fees for the arrangement would be presented, and the costs are amortized in the same line item in the statement of income as the expense for the associated hosting fees. The table below shows the treatment of different types of costs for on-premises and cloud-based solutions before and after the update to ASU 2018-15.

Does GAAP Allow the Cost to Be Capitalized?

Cost Function	Solution Type		Before ASU 2018-15	After ASU 2018-15
Software	On-Premises	On-site software	Yes	Yes
	Cloud-Based	Internal-Use License	Yes	Yes
		Usable only with the vendor's cloud service	No	No
Software Implementation Costs	On-Premises	On-site software	Yes	Yes
	Cloud-Based	Internal-Use License	Yes	Yes
		Usable only with the vendor's cloud service	**Diverse practice**	**Yes**
Storage	On-Premises	Hardware	Yes	Yes
	Cloud-Based	Hosting	No	No
Computation	On-Premises	Hardware	Yes	Yes
	Cloud-Based	Hosting	No	No

The treatment of implementation costs, regardless of whether the project is on-premises or cloud-based, is the same, and is based on the project stage. Implementation costs incurred during the preliminary project stage are expensed as incurred. Implementation costs to develop or obtain internal-use software incurred during the application development stage qualify for capitalization. Maintenance costs incurred during the post implementation stage are expensed as incurred. Training costs are expensed as incurred in every stage. The costs of upgrades and enhancements in the post implementation stage may be capitalized if it is probable that those costs will result in additional functionality. GAAP recognizes that such implementation costs benefit the entire term of the hosting contract and should be recorded as an asset, discussed further in the next section. This has been commonly implemented as shown by the proceedings highlighted in the Appendix.

When Are Hosting Arrangement Costs Expensed or Capitalized?



After GAAP updated its cloud computing standards in 2018, the Edison Electric Institute and various industry stakeholders sought clarification from FERC regarding how to apply the updated requirements within the Commission's existing accounting framework. In late 2019, FERC issued a final agency action letter clarifying how to apply ASU 2018-15 within the framework of USoA. This guidance allows FERC jurisdictional entities to treat implementation costs for cloud-based solutions similarly to on-premises IT solutions. Implementation costs shall be capitalized, recorded as a utility plant asset, and amortized or depreciated consistent with the requirements of the utility plant accounts in which they are recorded.[18] Generally, state commissions follow USoA as provided by FERC, but do maintain and exercise authority to modify their implementation of USoA to fit their own needs and regulatory goals.

Accounting Treatment of Regulatory Assets and Incentives

While GAAP requires cloud computing hosting fees, pursuant to a service contract, to be expensed as the service is rendered, GAAP also includes provisions that recognize the economic effects of entities subject to rate regulation. Accounting Standards Codification (ASC) Topic 980 allows a regulated entity to utilize a regulatory asset when cost recovery is permitted in a period of time different than the period otherwise required by GAAP, if rate recovery is likely at some point in the future. Until recovery takes place, the unrecovered costs associated with the regulatory asset incur carrying costs, just like other assets in a utility's rate base. Recognizing the economic effects of rate regulation, commissions may enable the recording of cloud-related expenses as regulatory assets to mitigate the impact of standard accounting treatment on the adoption of cloud computing. Thus, a regulated entity would be eligible to record a regulatory asset, with commission approval, either through cost-based regulation or a qualifying alternative revenue program, as discussed below. Several commissions have adopted a similar strategy with energy-efficiency related expenses, where standard treatment of programs as operating expenses was viewed as a hindrance to faster progress on energy efficiency goals.[19]

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[18] Federal Energy Regulatory Commission, *Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract*, Docket No. AI20-1-000, December 20, 2019. Available at: https://www.ferc.gov/sites/default/files/2020-05/AI20-1-000.pdf

[19] *See* Maryland Public Service Commission, Order 81637, Case 9111, Sept. 28, 2007, p. 6. Available at: http://webapp.psc.state.md.us/newIntranet/Casenum/NewIndex3_VOpenFile.cfm?FilePath=//Coldfusion/Casenum/9100-9199/9111/076.pdf

In addition, ASC 980 allows a regulated entity to recognize revenue and an associated regulatory asset under an alternative revenue program. Examples of this could include an incentive for achieving a particular goal or a return based on certain types of spending that could impact decision making. Commissions have the authority to authorize the use of regulatory assets or alternative revenue programs to address the economic effects of rate regulation and to place cloud-based and on-premises IT solutions on a more equivalent financial basis. Regulatory options, discussed in the next section, should try to level the economic impact on utilities for cloud-based and on-premises solutions, allowing utilities to choose solutions based on merit, rather than financial impact.

Options for Addressing Disincentives for Cloud Adoption

As the accounting section described in detail, both GAAP and USoA have several provisions that account for the financial impacts of state regulatory actions. These provisions allow utilities to record the policy and regulatory preferences of states according to standard accounting principles. While the authority of state commissions is not bound by these accounting principles, utilizing the existing provisions in GAAP and USoA will avoid substantial accounting complexity and uncertainty for both utilities and regulators. For this reason, this paper explores only those regulatory options that utilize mechanisms that are fully consistent with existing GAAP and USoA provisions.[20]

Beyond this threshold question of compatibility with established accounting principles, this paper evaluates the regulatory options on two criteria. The first is the extent to which a mechanism provides equity in the outcomes to the utility for selecting a cloud solution over an on-premises solution. The best outcome is for the financial impacts to be equal, leaving the utility financially indifferent between the two options, so that the only relevant issues that remain are the technical merits of the solution and providing the greatest cost-benefit over time for customers.

The second criteria is how well the mechanism preserves the flexibility of the cloud solution so that a utility can ramp up or decrease usage as needed and have payments fluctuate accordingly. Some mechanisms require prepayments that lock in certain service levels and costs well in advance, which puts utilities at risk of either not having enough capacity or paying too much for services they do not fully utilize (similar to the risks of an on-premises system). Preserving flexibility simplifies IT planning and operations for utilities and lowers risk to customers.

Regulatory Options

Prepayment as a Regulatory Asset

The prepayment option is most similar to how utilities typically invest in infrastructure, and for those utilities that have sought and been granted regulatory approval for capitalization of cloud computing expenses,[21] prepayment has been the most common method.[22] Utilizing this method, a utility pays for several years of cloud computing services in advance and amortizes the prepayment over a defined period, typically the length of the contract for the cloud service.[23] For example, a utility that prepays for five years of a cloud service places the prepayment in base rates, and is allowed to collects one-fifth of the initial value of the prepayment from rates as amortized each year, and receives a return at its

[20] The options presented in this paper build on a 2018 paper from Advanced Energy Economy Institute that explored the financial impacts of regulatory mechanisms designed to provide equivalent earnings on service-based solutions compared to the capital investments that they replace. That paper is available at: https://www.aee.net/aee-reports/utility-earnings-in-a-service-oriented-world

[21] In addition to capitalizing the solution itself, later additions of functions/new features of a cloud service should be capitalized.

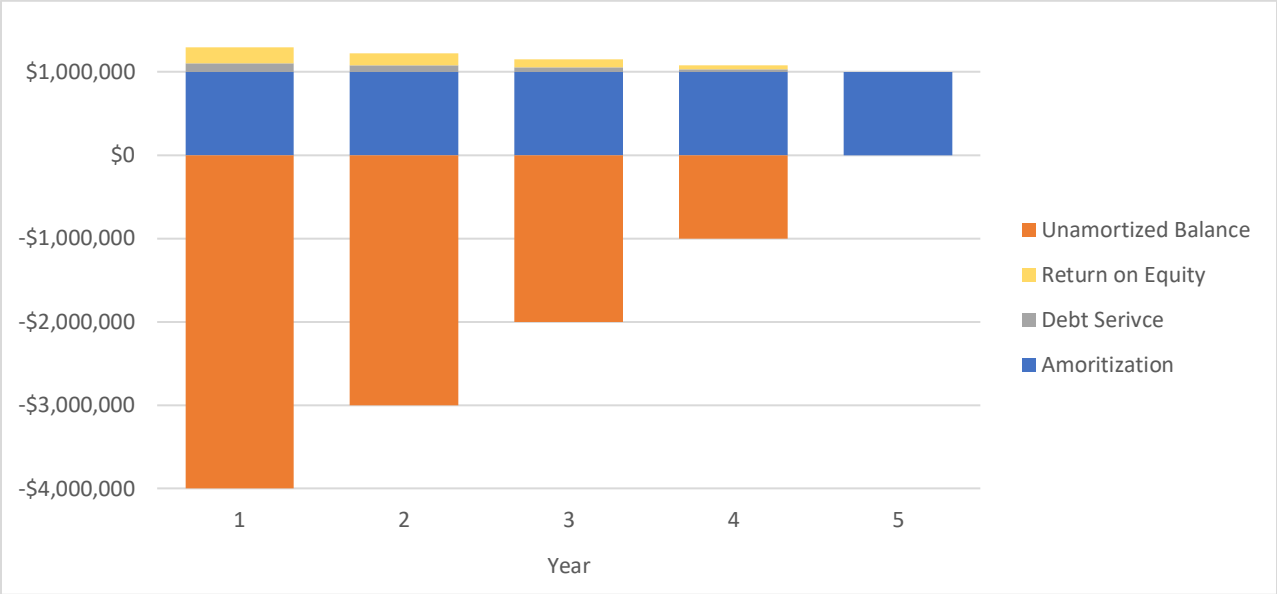
[22] A non-comprehensive list of regulatory actions that allow utilities to capitalize cloud computing expenses is available in the Appendix.

[23] While amortization periods are typically set at the expected useful life of an asset (in this case, the length of a service contract) to match the period of benefit received by a customer, Commissions do have authority to determine a different amortization period. For instance, in Alabama, the Public Service Commission allows utilities to amortize a prepaid cloud service over the expected life of the avoided capital plant in-service, such as an on-premises IT system. *See* Alabama Public Service Commission Order, Docket U-5825, February 5, 2019, p. 5. Available at: https://www.pscpublicaccess.alabama.gov/pscpublicaccess/PSC/PSCDocumentDetailsPage.aspx?DocumentId=bac287d0-de5d-44db-a48d-c9ef33bdf9e1&Class=Order

weighted average cost of capital (WACC) on the unamortized balance until the asset is fully amortized. A portion of that return is paid to debt holders to cover the cost of whatever capital was borrowed, and whatever remains is retained by the utility as earnings to provide shareholders a return on their investment.

This method of accounting and collection fits neatly into existing regulatory and utility practice because it is the same method used to finance nearly all forms of infrastructure, like poles, wires, transformers, and on-premises IT systems. In a hypothetical situation where the upfront costs and length of amortization for a pre-paid cloud computing solution and an on-premises IT solution are the same, the financial impacts would be the same. However, this method also treats the cloud service like other types of fixed infrastructure and would require a utility to estimate and purchase capacity several years in advance (just as it does for an on-premises IT system or a transformer). This impedes the use of cloud computing as a flexible service that can be ramped up and down on demand or outright cancelled, as needed. While most companies using cloud services are billed after the fact based on their actual use of services, a prepayment would lock in a utility at a particular cost, regardless of usage, limiting the flexibility of the solution and falling short of meeting both of the desired criteria.

Illustration:
Amortization of a hypothetical $5 million, five-year cloud solution using prepayment



Periodic Payments with Declining Amortization Period

In recognition of the importance of preserving the ability of utilities to leverage the flexibility of cloud computing, the staff of the Illinois Commerce Commission proposed an innovative solution in a proceeding on a potential rule to allow for the capitalization of cloud computing services.[24] The proposal would allow periodic payments based on the actual use of the cloud computing services by recording each payment as a regulatory asset that is amortized between when the payment was incurred and the

[24] *See* Initial Comments of the Staff of the Illinois Commerce Commission, Docket 17-0855, filed March 9, 2018. Available at: https://www.icc.illinois.gov/docket/P2017-0855/documents/267569

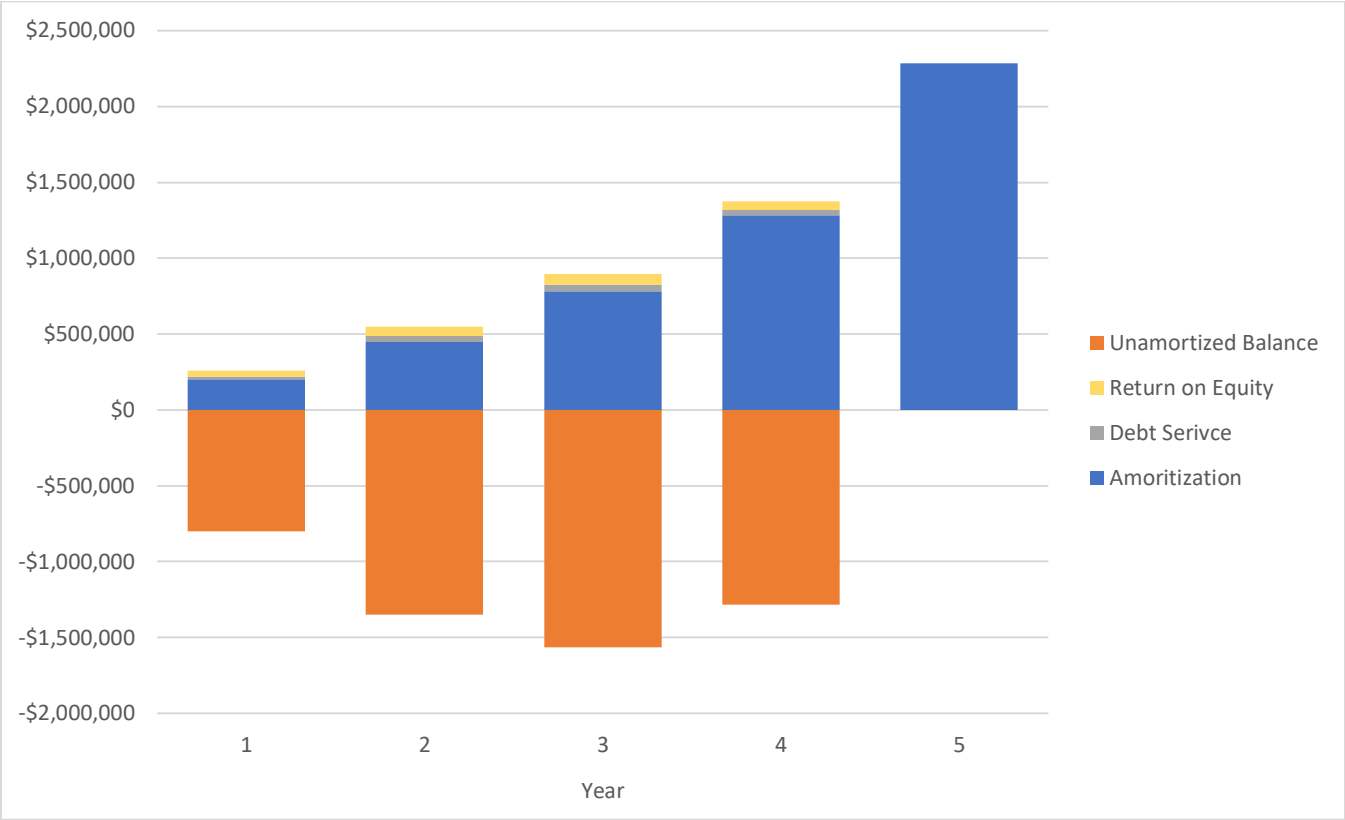
end date of the service contract. For example, a utility could sign a five-year service contract, but would not prepay for the service up front. Instead, each periodic payment would be recorded as a separate regulatory asset that would be amortized from the time the cost is incurred to the end of the service contract. As payments are made closer to the service contract end date, the amortization period for each payment decreases. In the example of a five-year service contract, a payment made in year one would be amortized for five years while a payment made in year three would only be amortized for three years (years three through five). So, while the mechanism allows for flexible payment schedules and variable periodic costs, it provides a decreasing length of time for the utility to earn a return on each payment as amortization accelerates for payments made closer to the contract end date.

This mechanism adheres well to the goal of retaining the flexibility of cloud computing. However, it comes with the drawback of only partly resolving the financial disadvantage associated with cloud computing use. If a utility were to utilize this solution and make equal payments over a five-year period that totaled the upfront expenditure of an on-premises IT solution, the earnings to the utility would only be half of what it could earn from the on-premises system.[25]

Additionally, there may be challenges for some utilities based on the ratemaking practices in each jurisdiction. Traditional straight-line amortization of regulatory assets and prepayments creates smooth annual costs because the amortization takes place in even increments. In contrast, the periodic payment mechanism creates spikes in annual costs of the solution as amortization accumulates in the final years. For those utilities on multi-year rate plans or formula rates, this should not be a problem as rates should reflect the resulting fluctuations in the utility's revenue requirement. However, utilities whose revenue requirements are more static, such as those that use historical test years, run the risk of having the revenue requirement set either too high or too low. In the event that a revenue requirement is set based on year one of the five-year contract, the increase in annual amortization toward the end of the contract means that the utility would incur losses during those years as costs exceed rate revenue. Conversely, if the rates are set when amortization peaks, a utility could be left with an unnecessary surplus as costs decline in future years when new contracts are signed or extended.

[25] Attachment 1 to the reply comments of Aqua Illinois and the Illinois American Water Company illustrate the earnings difference between a cloud computing system using the periodic payment method and an on-premises system. Verified Joint Reply Comments of Aqua Illinois, Inc. and the Illinois American Water Company, Docket 17-0855, filed April 9, 2018, p. 23.
Available at: https://www.icc.illinois.gov/docket/P2017-0855/documents/269268

Illustration:
Periodic Payments with declining amortization for a hypothetical $5 million, five-year cloud solution



Hybrid Solution

The two solutions described above each partly achieve both desired goals and may be combined in a complementary fashion to get a better blend of financial equivalence and flexibility rather than utilizing either method individually. With a hybrid solution, a utility pre-pays for the minimum capacity it expects to use and then pays for additional capacity, as needed, through periodic payments (analogous to the use of baseload and peaker plants). The non-flexible capacity would produce earnings on an equivalent basis as an equally priced on-premises system, while the periodic payments would retain flexibility for a smaller portion of the utility's IT needs at a reduced earnings rate.

Make-Whole Adder

The above solutions all utilize capitalization and placing costs in the rate base to address the financial disadvantages of cloud computing compared to on-premises solutions. However, it may be possible to achieve similar results through an approach that continues to treat cloud computing as an operating expense and retains the flexibility and simplicity associated with that treatment. A small adder could be included on the recovery of cloud computing expenses to make up for the opportunity cost of pursuing cloud computing instead of an on-premises IT investment.[26] For example, for every $100 of eligible

[26] A similar solution was adopted by the California Public Utilities Commission as a means of supporting non-wires alternatives. *See* CPUC Decision 1612036, Rulemaking 14-10-003, December 22, 2016.
Available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M171/K555/171555623.PDF

cloud computing costs, the utility could collect $105 in rates and retain the additional five percent to make up for the opportunity cost of not investing in an on-premises solution that would include a likely higher return. The five percent is merely a hypothetical example and this paper neither attempts to calculate nor suggest an appropriate amount of return for these expenditures under this model. However, it is anticipated that the size of such an adder would not need to be equivalent to capital expenditures, if there is a comparatively lower cost of capital associated with operating expenditures for cloud systems found in the particular jurisdiction. The implementation of the adder would be straight-forward to implement, as it could be recovered through an existing mechanism outside of base rates (like a tracker or surcharge) or it could be tracked until it can be included for recovery in rates as part of the next rate case.

The advantage of the adder is that it could fully achieve both of the desired goals of accounting equity and flexibility. As an operating expense, cloud computing would retain full flexibility without any additional complexity. Whether the adder achieves the point of financial indifference for the utility between choosing a cloud or on-premises solution depends on the amount of the adder. Although it is simple in design, calculating the percentage appropriate for recovery will likely include some vigorous debate among stakeholders in a regulatory proceeding.

Capitalization Rate[27]

In attempting to achieve financial parity between cloud computing and on-premises solutions, an important consideration is that not all on-premises system costs that can be replaced by cloud computing solutions are capital expenditures. On-premises solutions will have operating expenditures related to maintaining and operating systems. These operating expenditures can include items such as maintenance, labor, and minor updates. In the case of a cloud solution, these functions are included in the service and cannot be realistically itemized in the price of the cloud solution. Nor would there be direct equivalence in how these functions are performed by a cloud provider. Also, some services may not be delivered with capital or operating expenses in the same way that a utility would accomplish those services with an on-premises system, nor do cloud providers follow the same accounting rules (e.g., They do not follow USoA).

Because a cloud solution includes costs that would not be capitalized for an on-premises system, it may not be necessary to capitalize the full cost of a cloud solution. During the Illinois Commerce Commission's rulemaking on cloud computing, parties addressed this concern with a proposal to develop a capitalization rate for cloud computing solutions based on the historical mix of capital and operating expenses for utility on-premises systems. For the Illinois utilities, the average was slightly higher than an 80 percent capital to expense ratio, so the utilities proposed an 80 percent capitalization rate for cloud computing solutions.[28] The same percentage could also apply to a make-whole adder, where the adder would only be applied to a percentage of the costs (using the examples above, adder = 80 percent x 5 percent x Cloud Cost).

[27] While only two of the identified options utilize capitalization, this term is used for simplicity. For the make-whole adder, the adder could be applied to the percentage of total solution costs that would otherwise be capitalized.

[28] Response Comments of the Staff of the Illinois Commerce Commission, Docket 17-0855, April 10, 2020, p. 7. Available at: https://www.icc.illinois.gov/docket/P2017-0855

Implementation Considerations

In some states, regulators and utilities may be comfortable with proceeding with prepayments for cloud computing without formal action from a commission. However, both the periodic payments option and the make-whole adder will require clear regulatory authorization in order to comply with GAAP. To achieve equivalence with an on-premises solution, a regulatory solution should not place additional burden on commissions and utilities that would not be required for an on-premises system. For example, if a utility must seek permission each time it would like to capitalize a cloud solution, that would result in an additional burden that would introduce a new disincentive into decision making. Some states have different spending thresholds for when a capital investment requires pre-authorization from regulators. A new policy that allows utilities to capitalize cloud expenses is likely to work best when it provides the same approach to decision-making as a utility would normally use when considering an on-premises solution. Likewise, any investment of capital in a cloud solution should be subject to the same prudence review as any other capital expenditure.

Conclusion

Cloud computing across most industries is ubiquitous, where companies have found that its cost, flexibility, performance, resilience, and lower carbon impact better suit their customers' needs and corporate goals. For utilities, use of cloud computing represents a more difficult choice, as accounting standards and traditional cost-of-service regulation interact to create adverse financial impacts for utilities that are out of line with the potential greater cost efficiencies and benefits that cloud computing can provide to utility customers. This stands in contrast with a fundamental goal of regulation to align utility and customer interests. Updates to GAAP accounting standards in 2018 made progress on a related issue, the capitalization of implementation costs, but did not and were never intended to address the issue of regulatory incentives associated with the adoption of cloud computing for utilities. Fortunately, GAAP also recognizes the unique environment that utilities operate in and contains provisions that account for the authority of regulators to effect policy goals by modifying the economic impact of certain actions. Through comparison of regulatory options and selecting one that works best for their state, regulators can simultaneously address the disincentive associated with cloud computing and provide financial parity between cloud-based and on-premises solutions. Addressing these historic regulatory-induced disincentives with flexible solutions will increase the rate of adoption of cloud computing within the utility sector and speed the delivery of the flexibility, security, sustainability, and affordability benefits of cloud computing, that are widespread in other industries, to utility customers.

Appendix:
Current Examples of Regulatory Accounting Treatment of Cloud-Based Solutions by State

Initiating Company/ Organization	State	Docket, Final Order, & Status	Description
CAPITALIZATION OF THE CLOUD SOLUTION			
Alabama Power	Alabama	U-5285 Final Order (2/5/2019) Approved	Concerned that existing accounting principles are creating unequal application for software projects, Alabama Power requested authorization for regulatory accounting treatment, in which it would capitalize operations and maintenance costs associated with software expenditures exceeding $2 million, including cloud-based solutions, and then amortize the costs over the life of the comparable plant-in-service capital asset. However, post implementation operations stage maintenance costs would be expensed as incurred. Alabama Power also proposed a method for Commission Staff to review eligible projects annually. On February 5, 2019, the Commission approved this request.
New York State Department of Public Service	New York	14-M-0101 Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (5/19/2016) Approved	"Utilities can earn a return on some types of REV-related operating investments within the current accounting system. Numerous IT applications will need to be developed and implemented. Rather than developing their own software, many businesses find it more efficient to enter contracts to lease software services over extended periods, typically three to five years. To the extent that these leases are prepaid, the unamortized balance of the prepayment can be included in rate base and earn a return. As utilities evaluate whether to purchase or lease these applications, their ability to earn a return on a portion of the lease investment should help to eliminate any capital bias that could affect that decision."
Illinois Commerce Commission	Illinois	16-NOI-01 16-NOI-01 Final Order (2/10/2016) 17-0855	The ICC has initiated two proceedings: the first (16-NOI-01) was established to gather information and tasked Staff with developing a rule to level the playing field for on-premises and cloud computing solutions. The second (17-0855) was initiated to clarify the accounting rules around cloud-based solutions,

Initiating Company/ Organization	State	Docket, Final Order, & Status	Description
		Final Order (7/15/2020) Not Approved	specifically whether utilities can rate base 80 percent of costs and have the remaining 20 percent to be recorded as an operating expense. The ICC did not adopt this change.
CAPITALIZATION OF CLOUD IMPLEMENTATION COSTS			
Idaho Power Company	Idaho	IPC-E-20-11 Final Order (6/25/2020) Approved	Approval to defer certain costs associated with cloud computing arrangements to a regulatory asset, excluding integration costs. The Commission also acknowledged that the unamortized regulatory asset amounts are eligible for rate base treatment and the associated annual amortization expense is eligible for potential recovery in a future rate proceeding.
Northern Indiana Public Service Co	Indiana	45159 Final Order (12/4/2019) Approved	NIPSCO received approval to account for pre-paid cloud-based solutions in the same manner as on-premises solutions by capitalizing implementation services, internal labor, and other fees (licenses, maintenance and support) necessary to bring the solution into service, and amortizing costs over the contract term.
Consumers Energy	Michigan	U-20134 Final Order & Settlement Agreement (1/9/2019) Approved	Request to defer regulatory accounting treatment for cloud-based solutions, including upfront transition costs. Consumers Energy would follow its capitalization policy for on-premises technologies to determine the appropriate amounts to defer, which would then be amortized over the expected useful life of the investment. The request received support by Commission Staff and was included in a settlement agreement later approved by the Commission.
Duquesne Light Company	Pennsylvania	R-2021-3024750 Final Order (12/16/2021) Approved	"Consistent with the settlement in the Company's last base rate case, Docket No. R-2018-3000124, the Company shall be permitted to capitalize the development costs for cloud-based information systems. The Company has recorded the costs related to the development of cloud-based information systems as a regulatory asset at the time such costs are incurred and has begun amortization of the costs after the systems were placed in service. The Company has elected, as of January 1, 2022, pursuant to ASU 2018-15, to capitalize all future-cloud based information system development costs. Pursuant to this Settlement, the Company will be

Initiating Company/ Organization	State	Docket, Final Order, & Status	Description
			permitted to transfer any remaining unamortized cloud-based information system costs to the appropriate plant account as of December 31, 2021. Nothing in this provision shall preclude a challenge to the prudence or reasonableness of specific cloud-based expenditures in a future base rate proceeding."
UGI Utilities	Pennsylvania	R-2017-2640058 ALJs' Recommended Decision (8/24/2018) Final Order (10/25/2018) Approved	The Commission's Final Order adopts language in the ALJs' Recommended Decision. "These Joint Stipulation provisions are in the public interest because they recognize that the new data bases will provide benefits to customers over extended periods of time and not just the period in which the costs are incurred. UGI Electric's cloud-based services will offer many advantages to traditional on-premises software such as enhanced security, reliability, and flexibility. The data bases created for the cloud-based services will be used by UGI Electric to optimize various aspects of the utility service provided to its customers over, at a minimum, the life of the cloud-based service agreement."

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