Capitalizing the Cloud

An analysis of challenges and opportunities for the Canadian utilities sector

Prepared for the Canadian Electricity Association and the Canadian Gas Association

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Final Report

March 19, 2020

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Executive summary

In October 2019, the Canadian Electricity Association and the Canadian Gas Association engaged KPMG to:

– undertake an evaluation of the challenges associated with the capitalization of cloud services by Canadian electric utilities; and

– develop an accompanying series of potential options for Canadian regulatory tribunals to consider when undertaking policy development and/or rule-making on this topic.

This report summarizes the findings of our review.

While the examples included in this report are predominantly electricity sector focused, the application of the findings are applicable to the gas sector as well. For details on gas sector applicability, see section 8 of this report.

Our review was based on research and analysis of publicly available sources and data (including sources from other jurisdictions), extensive stakeholder consultations (which included 31 external consultations with individuals representing the perspectives of 17 Canadian utilities, 6 Canadian and U.S. utility regulators, 5 cloud providers and 3 industry associations) and indicative financial modeling of alternative options for setting rates to recover cloud expenses.[1]

Throughout this report, “cloud” refers to cloud-based computing arrangements: the on-demand availability of computer system resources — especially data storage and computing power — without direct active management or ownership by the user.

Overview

As cloud computing technology has matured, so too has the market for cloud services, which now covers the entire spectrum of electric utility services, operations and value proposition. Primary drivers of cloud adoption by utilities often include the increased flexibility, security and agility available through cloud computing arrangements. Such arrangements may also offer the potential for lower costs and increased efficiency, relative to traditional IT systems that are owned and managed on-premise.

Key findings

Current economic regulatory models can disincentivize the adoption of cloud services by Canadian electric utilities because cloud investments fall outside of the rate base. This is due in part to remuneration models used by regulators that allow for rates of return on capital assets owned by utilities but not for subscription-based services and related implementation costs, which are treated as operating expenses not eligible for a return.[2]

For example, the fees paid to cloud providers are expensed as incurred, and only certain implementation costs can be deferred under US GAAP. Under IFRS, it is difficult to have significant

[1] Stakeholder consultations were conducted on a not-for-attribution basis.
[2] Under both US GAAP and IFRS, where the customer obtains only a right to receive access to the supplier’s application software, the hosting arrangement will be accounted for as a service contract with the fees paid being expensed as incurred. In a hosting arrangement that is a service contract, some implementation costs will be capitalized under US GAAP but implementation costs will typically be expensed as incurred under IFRS.

implementation costs deferred or recognized as an intangible asset. Recent guidance issued by the Financial Accounting Standards Board and IFRS Interpretation Committee has not significantly changed applicable accounting rules.

Jurisdictional review

In November 2016, the National Association of Utility Regulatory Commissioners ("NARUC") — the U.S. national association representing state public service commissioners who regulate essential utility services — adopted a resolution encouraging state utility regulators to consider:

– "whether cloud computing and on-premise solutions should receive similar regulatory accounting treatment, in that both would be eligible to earn a rate of return and would be paid for out of a utility's capital budget." [3]

In 2017, the Illinois Commerce Commission ("ICC") initiated a proceeding to consider rules relating to the regulatory treatment of cloud-based computing solutions in Illinois. The objective was to create a rule that would "level the playing field between on-premise and cloud-based computing systems by clarifying the regulatory accounting rules to provide comparable accounting treatment of on-premise and cloud-based computing systems."[4]

The above proceeding has evolved over time and has experienced some procedural delays. However, the current proposed rulemaking provides that, going forward, a public utility would be permitted to record as a regulatory asset and, subject to the ICC's determination of prudence and reasonableness in a rate case, include in its rate base the costs associated with cloud-based arrangements that would otherwise be recorded as utility plant if the costs were for an on-premises computing solution, rather than a third-party cloud-based computing solution.

Other jurisdictions, such as the State of New York, have implemented options for changes to the regulatory accounting treatment of distributed energy resources ("DER") that may be relevant for cloud computing arrangements in the Canadian context. New York's Reforming the Energy Vision ("REV"), the State's current long-term energy vision document, may offer insights into the broader topic of capitalizing the cloud in its evaluation of the potential for DER. As with the cloud, DER arrangements often require utilities to balance trade-offs between making on-site capital investments versus committing to ongoing third-party operating expenditures. In particular, DER often entails "…valuing alternative resources by focusing on the traditional costs that can be avoided."[5] Changes proposed under REV include:

– utilities will be permitted to earn a return on some types of operating investments within the current accounting system; and

– for pre-paid leases of IT applications, the unamortized balance of the pre-payment can be included in rate base and earn a return. This should presumably cover cloud applications.

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[3] National Association of Utility Regulatory Commissioners, "Resolution Encouraging State Utility Commissions to Consider Improving the Regulatory Treatment of Cloud Computing Arrangements," sponsored by the Committees on Critical Infrastructure, Gas, and Water; adopted by the NARUC Committee of the Whole on November 16, 2016, available at: https://pubs.naruc.org/pub.cfm?id=2E54C6FF-FEE9-5368-21AB-638C00554476

[4] ICC, Docket No. 17-0855, Staff Report to the Commission, "Regulatory Accounting Treatment for Cloud-Based Computing Systems", June 17, 2019, p.1.

[5] New York Public Service Commission, Case 14-M-0101, "Staff White Paper on Benefit-Cost Analysis in the Reforming Energy Vision Proceeding," filed by Theodore Kelly, posted 07/01/2015

Policy options

The table below presents a summary of policy options reviewed as part of this study, including definitions and potential advantages and disadvantages:

– Option 1 – Defer payments over remaining term

– Option 2 – Defer payments over fixed term

– Option 3 – Prepayment

– Option 4 – Treat as a capital lease

– Option 5 – Provide an earnings uplift

– Option 6 – Defer implementation costs

We conclude that the different rate making approaches analyzed have quite different impacts on the allocation of costs to consumers over time, on utility funding requirements, and on the profile of cost recovery. Accordingly, the best option in any given circumstance may depend on the specific factors at play. Relevant considerations may include the size of the project relative to overall capital budgets, the degree of incentive required and the accuracy of cost estimates available. We also note that for any specific cloud project, it may be difficult to estimate the relevant parameters of the displaced in-house project. Thus, the extent of lost shareholders earnings may not be clear.

Our analysis in this report is indicative of the relative differences between alternative approaches. However, in any given instance, the analysis should be updated to reflect the actual circumstances of a particular cloud project. Based on our analysis and the specific assumptions used, it is clear that the alternative options do have considerable potential to offset the earnings that shareholders forego when moving away from traditional in-house projects. In sum, they can be a valuable tool for regulators that want to encourage the move to alternative computing arrangements.

Summary of policy options reviewed				
#	**Option**	**Description**	**Advantages**	**Disadvantages**
1	**Defer payments over remaining term**	Annual cloud payments would be capitalized and amortized over remaining length of contract term	– Allows utilities to earn a return on cloud payments, helping to offset lost earnings on traditional IT investments. – Payments are still collected within the period of the cloud contract, ensuring that costs are matched with benefits on an overall basis.	– Results an uneven recovery of costs from consumers over the period of the cloud contract; as a result of the mechanics of this approach, the recovery of costs is shifted towards the end of the contract. – Increases utility funding requirements somewhat, since cost recovery in the early part of the contract term is deferred. – Requires more administrative effort, since accounting arrangements become more complex.
2	**Defer payments over fixed term**	Each annual cloud payment would be deferred and amortized over a period equal to the initial length of contract term	– Relative to Option 1 this results in a more even recovery of costs over time. – The increase in rates toward the end of the term is less significant because cost recovery is extended beyond the contract term.	– Runs counter to the general principle that costs should be matched to benefits. (Under this principle, the consumers that benefit from a service should be the ones that pay for it.) – Under the approach of capitalizing each payment for a fixed period, consumers in the period beyond the contract term continue to pay for the contract, even though it is no longer providing service (and benefits) to the utility. It thus raises issues of inter-generational equity. This is difficult to justify under normal cost allocation principles for regulated utilities. – Similar to Option 1, there is an increase in utility funding requirements and some minor administrative complexity (although both issues should be manageable).
3	**Prepayment**	Cloud computing services would be pre-paid (rather than paid annually over the contract term); upfront payment would be	– Relative to Options 1 and 2, this results in a more even recovery of costs over time. – Cost recovery is very similar to that for a traditional in-house project.	– If contract terms are not appropriately drafted to allow for service changes, prepayment could result in less flexibility for the utility, making it more difficult for the utility to make changes during the contract term because it has been prepaid.

Summary of policy options reviewed				
#	**Option**	**Description**	**Advantages**	**Disadvantages**
		deferred and costs recovered over life of contract.	– There is Canadian regulatory precedent for treating certain costs this way, such as DSM costs in Quebec and British Columbia.	– Prepayment may result in more credit risk for the utility since it is more dependent on the continued solvency of the cloud provider. Credit assessments and/or performance bonds could help to mitigate this risk. – In practice, prepayment may not be realistic for contracts with longer-term duration, particularly beyond 5 years. – Negates the savings in upfront cash flows that would otherwise be associated with the cloud solution (other than those that occur because the cloud solution is cheaper). Utility financing needs are thus higher than they otherwise would be.
4	**Treat as a capital lease**	Present value of cloud computing contract would be capitalized at beginning of contract term. Unlike prepayment option, however, actual cash payment stream to contract provider remains the same.	– Similar to the prepayment option, it results in a relatively even recovery of costs from consumers over time. – Relative to the prepayment option, it does not require that the utility shifts its cash expenditures forward. Payments to cloud providers remain as under the cloud option, meaning that there is no loss of flexibility (i.e., in changing the contract) or increase in financial risk (because of increased credit exposure). – There is Canadian regulatory precedent for allowing utilities to include lease assets in the rate base and to earn an interest at the rate of return, such as Toronto Hydro in Ontario.	– Some mismatch between utility costs and revenues. – Revenues are greater than cash costs in early years and lower in later years. This effectively results in positive cash flows to utility shareholders in earlier years, which must then be "repaid" in later years. – Our modeling suggest that for utility shareholders to be kept "whole" the discounted value of lease payments used to set up the capital asset must use the post-tax cost of capital rather than the pre-tax cost of capital. (This results in higher costs of consumers measured on a net present value basis.)
5	**Provide an earnings uplift**	Earnings incentive provided to utility in the form of a mark-up on cloud expenses	– Directly addresses the issue — that utilities' shareholders lose benefits associated with putting capital at work.	– Results in additional, observable cost that is directly transferred to consumers — a "deadweight" cost. – As with any incentive that is a fixed percentage of cost, it provides utilities with an incentive to increase the

Summary of policy options reviewed				
#	**Option**	**Description**	**Advantages**	**Disadvantages**
			– Doesn't alter general pattern for recovery of costs from consumers; generally considered good cost allocation practice. – Adder could be adjusted for different circumstances. – Visible and transparent policy tool. – Does not require changes to accounting rules.	costs associated with the program in question. Greater oversight will be needed to ensure that reported costs are prudent. – May provide utilities with an incentive to categorize costs as cloud-related in order to gain the uplift. Some administrative effort may be required to police this.
6	**Defer implementation costs**	Utility allowed to defer implementation costs that would otherwise be expensed.	– Relative to other options, this is a relatively small change to accounting practice; it may thus be easier for stakeholders and regulators to accept and implement. – Arguably results in a better matching of costs to benefits since implementation costs are recovered over the period of the cloud contract rather than coming out of expenses in starting year.	– As a relatively small adjustment, it only addresses part of the shareholder benefits lost with a move to cloud computing.

1 Introduction

1.1 Study background

The Canadian Electricity Association and the Canadian Gas Association engaged KPMG to:

– undertake an evaluation of the challenges associated with the capitalization of cloud services by Canadian electric utilities; and

– develop an accompanying series of potential options for Canadian regulatory tribunals to consider when undertaking policy development and/or rule-making on this topic.

KPMG's scope included:

– accounting, regulatory and policy research on the specific barriers to capitalizing the cloud in the current utility tribunal context;

– stakeholder consultations to describe the current state of cloud adoption among Canadian electric utilities and the associated opportunities and challenges of the cloud for utility operations;

– jurisdictional benchmarking of developments on these issues across North America;

– financial analysis of potential options for capitalizing the cloud; and

– an overall assessment analyzing the high-level applicability to the natural gas sector of both the capitalization of cloud services and the underlying principles reviewed.

1.2 Structure of this report

This report is organized as follows:

– **Chapter 2: Cloud in the utility context** presents a high-level background of the cloud;

– **Chapter 3: Accounting for cloud computing arrangements** describes the accounting requirements with respect to the costs incurred for cloud services;

– **Chapter 4: Stakeholder consultations** presents seven key messages that stakeholders communicated to us about current challenges and opportunities of capitalizing the cloud;

– **Chapter 5: Jurisdictional review** describes developments in a number of US and Canadian jurisdictions in regard to alternative rate setting approaches for cloud computing, utility remuneration and related topics.

– **Chapter 6: Policy evaluation** provides an assessment of policy considerations and the advantages and disadvantages of alternative approaches for the rate treatment of cloud computing.

– **Chapter 7: Financial analysis** summarizes the findings from our financial analysis of a number of alternative options for setting rates to recover cloud computing expenses.

– **Chapter 8: Applicability to other sectors and applications** assesses the applicability of the rate-making options discussed within the report for other utility sectors and expense categories.

2 Cloud in the utility context

In this Chapter we provide an overview of cloud computing arrangements and the rationale for their adoption.

2.1 Overview of cloud computing

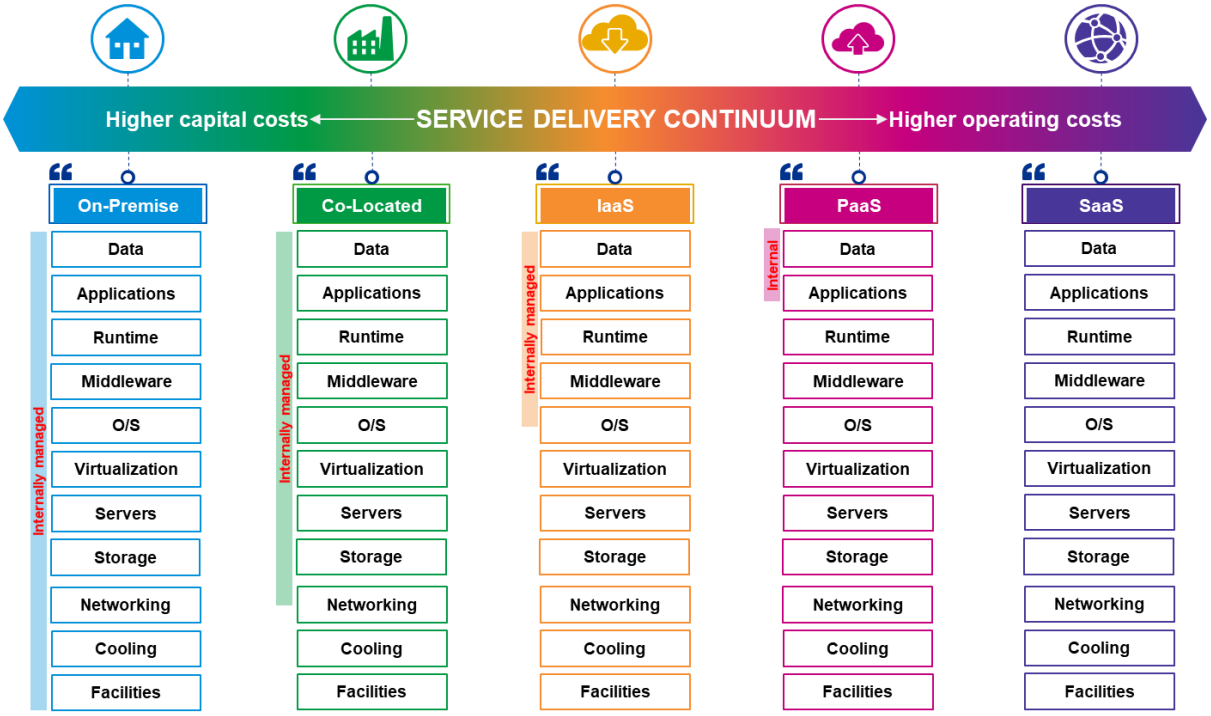
The early precursor to cloud computing was managed services. In this business model, companies pass their computing requirements to a dedicated provider that provides the same in-house services back to the customer. Objectives of these relationships are often to reduce costs, increase quality and allow companies to focus on their core business operations. Challenges with this model are that every outsourcing contract varies and, in turn, the service provider's ability to achieve economies of scale is limited. Additionally, the ability to walk away from an underperforming service provider is limited, since it includes costly and time consuming transition costs. By contrast, cloud computing generally offers standardized services where clients choose from a set of options and pay according to what they select and how much they consume.

Leveraging a cloud provider is similar to a managed services arrangement in that the cloud provider manages the majority of the back-end requirements such as facilities, cooling, networking, servers and storage — but the core difference is that the options are standardized. This differentiating factor enables the cloud provider to achieve economies of scale that are passed on to the client. Furthermore, it allows the client to increase capacity for data storage and processing as well as to create new technical operating environments depending on business demands. The choice for the client becomes employing the standardized cloud options to suit its core technical requirements while maintaining sight on the impacts to business capabilities.

2.2 Service delivery models and deployment

There are now many cloud providers and thousands of different cloud services. The figure below illustrates some of the broad classifications of deployment models, including cloud-specific arrangements:

– Infrastructure as a Service ("IaaS");
– Platform as a Service ("PaaS"); and
– Software as a Service ("SaaS").



In addition to the desired service delivery option, customers may choose the deployment model depending on what would support operations most effectively. Broadly, cloud services come in three distinct deployment models, each of which possesses its own set of benefits and challenges:

– **Private or dedicated cloud** is a deployment model where the organization possesses a cloud service that is physically isolated. In essence, it is a privately-owned cloud where the organization maintains ownership of server and computing infrastructure. While connectivity (network) services may be shared with others, data is on the client's physical cloud, which is separate from others' clouds. This enables the organization to provision resource-based access (e.g., to storage, virtual machines or processing power) to various business units as required. A benefit of this deployment is that it enables the organization to manage the infrastructure as it sees fit, while centralizing the technical effort and providing access to the business based on operational demand. However, this is an expensive approach.

– **Public cloud** is a shared, physical cloud where many customers use the same underlying cloud infrastructure. The infrastructure is centrally owned and managed by a service provider (such as Microsoft Azure or Amazon Web Services), but client data is separated digitally. Logical separation and data protection are provided using virtual containers, access keys and encryption. Data may be shared or duplicated across multiple data centres, which could provide an additional layer of protection. This is typically a less expensive option than private cloud resulting from economies of scale.

– **Hybrid cloud** is a combination of Public or Private cloud and on-premise infrastructure. By configuring an organization's on-premise infrastructure to integrate into a cloud environment, it is possible to extend that on-premise infrastructure into the cloud (i.e., off-premise). This enables

the organization to gain some benefits of cloud while maintaining some benefits of the on-premise infrastructure. Organizations may take this approach to provide an on-premise infrastructure to transition applications into, before they migrate them into the native cloud, or to house specific mission critical data and applications. In some cases, this becomes a staging environment. Alternatively some organizations implement Hybrid cloud as a way of preserving their existing on-premise investment that may have significant asset life remaining.

Cloud computing costs can differ significantly among vendors and/or solutions. For example, certain cloud solutions could have higher implementation costs (e.g., capital, prepaid, intangible, deferral) and lower ongoing licensing costs (O&M); or the opposite, where implementation costs are lower and the ongoing licensing costs (O&M) are higher. As such, there exists a range between these two, which may impact the regulatory accounting issues are around implementation costs and ongoing licensing.

2.3 Common benefits of cloud

Depending on the cloud service, there are several common benefits that can influence an organization's decision-making.

2.3.1 Cost reduction

Some organizations have found that they can achieve cost savings of up to 40% when compared to their on-premise costs. By moving to cloud, organizations can move to a utility-based consumption model where costs can be allocated to specific business units based on their use of services. This results in the potential for more effective tracking of the true costs of business services and of associated consumer needs. As well, costs can be managed as the service scales up to meet peaks in demand and costs can be reduced as the service scales back down to average demand or even falls to below average levels. Organizations can also avoid the high capital costs of major upgrade programs and infrastructure refresh programs.

2.3.2 Security, reliability and high availability

Until relatively recently, there were significant concerns that major vendors did not have robust cyber security, data privacy and associated compliance mechanisms. Many organizations therefore did not move to cloud or did so very cautiously. The risk of data loss, hacking or other criminal behaviour was deemed to be too high. However, over the past few years the major vendors have significantly matured. Vendors have worked with the regulatory bodies in each industry and in multiple jurisdictions. On the one hand, vendors have sought to educate and influence regulators, but on the other hand regulators have been able to impart the underlying drivers behind legislation. As well the vendors have worked with the security, risk and compliance departments from private and public organizations to improve their offerings.

Data privacy and protection has become a predominant concern of many cloud users and subscribers. Consequently, more stringent privacy regulations have been developed globally to protect consumer and personal data. Cloud service providers have reacted to these emerging regulatory changes and created operating models that align to regulatory requirements with little or no impact to performance and pricing for subscribers. Some of these regulations include PIPEDA (Canada) and GDPR (EU).

As an example, in the case that an organization requires that data is stored within Canadian borders, cloud providers have responded and created options to support this need while maintaining the benefits of moving to the cloud such as redundancies, scalability and overall resilience. Many providers have multiple storage sites in different regions within Canada. Data is stored, transferred and duplicated between Canadian regions as needed instead of having to be stored in both Canada and another international region such as the USA.

Furthermore, cloud security has advanced greatly over the past decade. Most cloud providers have adopted most of the globally recognized cybersecurity standards and are developing stronger security protocols continuously. The cloud vendors typically will also have a high degree of physical security which in many cases would be stronger than that of an on-premise alternative.

2.3.3 Agility and time to market

Engaging standardized suites of cloud services in a multi-cloud delivery architecture can enable organizations to quickly build new services and applications. There is almost no lag time to setup the supporting infrastructure and platforms or to build out the application. Organizations can focus on the key differentiators for their customers, which may be the use of data or the service itself and not the underlying support structure. The cost of failure can also be significantly reduced.

2.4 Utility sector cloud

Power generation, transmission and distribution businesses are highly complex, technical and capital intensive. Applicable utility business operations include:

- customer billing
- grid operations
- advanced metering infrastructure
- demand response systems
- meter data systems
- customer relationship management

With new digital technologies such as Data Analytics, AI, IoT and 5G, the opportunity exists to expand the smart meter network into household devices. Smart fridges, microwaves and stoves can provide real-time telemetry and can have variable power consumption based on the immediate requirement. A fridge that is not full may have different power consumption than one that is full. The opportunity is for energy consumption to be intelligently managed, often at the edge of the network where consumption occurs. This will entail a better understanding of the consumer's needs and the application of energy services that are appropriate to the need. The reduction of environmental impact and the need to focus on clean energy can be enabled by digital technologies. By moving to cloud and reducing the effort required to "keep the lights on", the energy organization is better able to focus on value added services.

3 Accounting for cloud computing arrangements

In this Chapter we review the accounting rules that relate to the treatment of cloud computing costs. Chapter 5 addresses regulatory treatment of cloud computing costs.

3.1 Background

Cloud computing arrangements (‘‘CCAs”) have been gaining popularity across the globe over the past few years and are by far the most prevalent new digital technology; quickly replacing on-premise software and hardware arrangements. A common CCA is the Software as a Service (“SaaS”) arrangement, which uses an internet-based application software hosted by a service provider or other third party. A SaaS arrangement may or may not include a software license.

Accounting standards bodies have recently caught the technology wave and some have issued guidance with respect to the accounting for fees paid for a SaaS arrangements. In some cases they have also addressed the accounting for the related implementation costs.

3.2 US GAAP

FASB ASC Subtopic 350-40 Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40) provides guidance on the accounting for the cost of computer software developed or obtained for internal use. It requires certain costs to develop or obtain software to be capitalized. However, until recently, US GAAP did not include any explicit guidance on the accounting for fees paid in a CCA nor for the implementation costs incurred. As a result, there was diversity in practice in accounting for the fees and implementation costs incurred.

In April 2015, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update 2015-05 *Customer’s Accounting for Fees Paid in a Cloud Computing Arrangement* (ASU 2015-05) to help customers (i.e. companies using CCAs) evaluate the accounting for fees paid by a customer in a CCA. ASU 2015-05 provides guidance about whether a CCA includes a software license (see below), which drives the costs that may be capitalised. ASU 2015-05 took effect in 2016 for public companies.

In August 2018, the FASB issued ASU 2018-15 *Customer’s Accounting for Implementation Costs incurred in a Cloud Computing Arrangement that is a Service Contract* (ASU 2018-15). The intent was to clarify and align the accounting for implementation costs in a hosting arrangement that is a service contract with those costs capitalized for software developed or obtained for internal-use (see below). ASU 2018-15 will take effect in 2020 for public companies. The amendments can be early adopted and are applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption.

3.2.1 Accounting for fees paid in a CCA (ASU 2015-05)

ASU 2015-05 amended Subtopic 350-40 to clarify whether a hosting arrangement (e.g., CCA or SaaS) contains a software license and, thus, whether a customer should account for the arrangement similarly to other internal-use software (or on-premise software).

A hosting arrangement in connection with accessing and using software products is defined in the ASU 2015-05 (and amended by ASU 2018-15) as an arrangement in which the customer of the

software does not currently have possession of the software; rather, the customer accesses and uses the software on an as-needed basis.

For a hosting arrangement to qualify as a software license, it must meet the following criteria:

– the customer has the contractual right to take possession of the software at any time during the hosting period without significant penalty. There is considered to be no significant penalty if the customer has the ability to take delivery of the software without incurring significant cost and if it has the ability to use the software separately without significant loss of utility or value; and

– it is feasible for the customer to either run the software on its own hardware or to contract with another party unrelated to the vendor to host the software.

If both of the above criteria are present, then the hosting arrangement contains a software license.

If a CCA includes a software license, then the software license is accounted for by the customer in accordance with Subtopic 350-40. This generally means that:

– an intangible asset is recognized for the software license (i.e., customers can generally capitalize the present value of the future payments for the software and subsequently amortize the cost over the license period); and

– to the extent that the payments attributable to the software license are made over time, a liability is also recognized.

If a CCA does not include a software license (i.e., if both of the above criteria are not present), then the entity should account for the arrangement as a service contract. This generally means that the fees associated with the hosting element (service) of the arrangement are expensed as incurred as an operating cost.

3.2.2 Accounting treatment since the issuance of ASU 2015-05

The guidance in ASU 2015-05 has been in effect since 2016 and, in KPMG's experience, most CCAs continue to be accounted for as a service contract (i.e., the fees paid are expensed as incurred). This is because the terms and conditions of most CCAs do not allow for the customer to take possession of the software. This is supported by the FASB's outreach in connection with Issue No. 17-A "*Customer's Accounting for Implementation, Setup, and Other Upfront Costs Incurred in a CCA that is Considered a Service Contract*".

In 2017, the FASB staff performed an outreach with preparers (customers in CCAs) and cloud service providers (the "Task Force").[6] In the outreach it was identified that:

– Customers in CCAs generally no longer have the ability to take possession of the software without losing the benefits associated with a CCA. The benefits would include, for example, the consistent experience for all customers and the optimized environment of not having to maintain multiple

[6] Financial Accounting Standards Board, Memo, Project: Issue No. 17-A, "Customer's Accounting for Implementation, Setup, and Other Upfront Costs (Implementation Costs) Incurred in a Cloud Computing Arrangement That Is Considered a Service Contract", Issue Summary No. 1, Supplement No. 1", dated September 28, 2017, available at: https://www.fasb.org/cs/ContentServer?c=Document_C&cid=1176169364442&d=&pagename=FASB%2FDocument_C%2FDocumentPage

versions. Additionally, cloud service providers generally do not permit the customer to take possession of the software for proprietary reasons.

– CCAs are viewed as a favourable alternative to an on-premise solution. This reflects the fact that there are significant benefits related to the infrastructure, which appear to outweigh the significant implementation costs that are incurred. Therefore, customers who negotiate with cloud service providers generally already have accepted the CCA model without needing to take possession of the software.

3.2.3 Accounting for implementation costs incurred in a CCA (ASU 2018-15)

While ASU 2015-05 addressed the accounting for fees paid in a service contract, questions arose on how to account for the related implementation costs. This is because if a software license is acquired, costs related to implementation can be capitalized in accordance with Subtopic 350-40. In a similar way, customers incur significant implementation costs for a hosting arrangement that is a service contract. However, the accounting guidance on the treatment of these implementation costs was not as clear as it is for software licenses. Therefore, customers requested that the FASB provide additional guidance on the accounting for costs of implementation activities, such as implementation, setup and other upfront costs (collectively referred to as implementation costs) performed in a CCA that is a service contract. As the guidance is not explicit in that area, in August 2018, the FASB issued ASU 2018-15 to address the diversity observed.

Accordingly, the amendments in ASU 2018-15 are seen to improve US GAAP because they clarify and align the accounting for implementation costs for hosting arrangements, regardless of whether the implementation costs include conveying a license to the hosted software.

Paragraph BC8 of the Basis for Conclusions to ASU 2018-15 explains how the Task Force reached its consensus on the accounting for implementation costs and notes the following:

– When implementing a hosting arrangement that is a service contract an entity may incur significant costs that may indicate a future benefit to the entity beyond the period over which the implementation services are performed.

– While the right to receive the service and the obligation to pay for the service as the service is provided are not recognized on the balance sheet, the Task Force observed that certain costs to implement the hosting arrangement enhance the unrecognized right to receive the related service.

– Accordingly, the Task Force decided that the implementation costs of a hosting arrangement that is a service contract could be attached to the service contract and, therefore, should be deferred as an asset and recognized over a period longer than the period over which the implementation services are provided. That is, those deferred costs, while not representative of an asset on a standalone basis, result in an increase in future benefits to be received under the hosting arrangement, thus resulting in an asset related to the service contract.

– While overall the FASB and Task Force concluded that it is important that guidance be developed in a manner in which the outcome is both relevant to investors' needs and responsive to preparers' ability to apply the guidance, some Task Force members weighed the expected costs and expected benefits differently in determining the consensus and its interaction with the FASB conceptual framework.

– In determining the consensus, the Task Force decided that it represents a practical solution that addresses the original concern that was raised to the Task Force and that it is responsive to the unique characteristics of hosting arrangements that are service contracts.

While ASU 2018-15 clarifies the accounting for implementation costs, it does not define implementation costs. This is because it was noted that Subtopic 350-40 already provides sufficient guidance on implementation costs and that guidance is currently being applied in practice.

In accordance with Subtopic 350-40, most costs to implement a licensed software are capitalized, such as costs to customize, configure and/or install the software in the customer's IT environment. Certain other costs typically incurred before a customer "goes live" with a new software solution — such as data conversion, training and business process reengineering — are expensed as incurred.

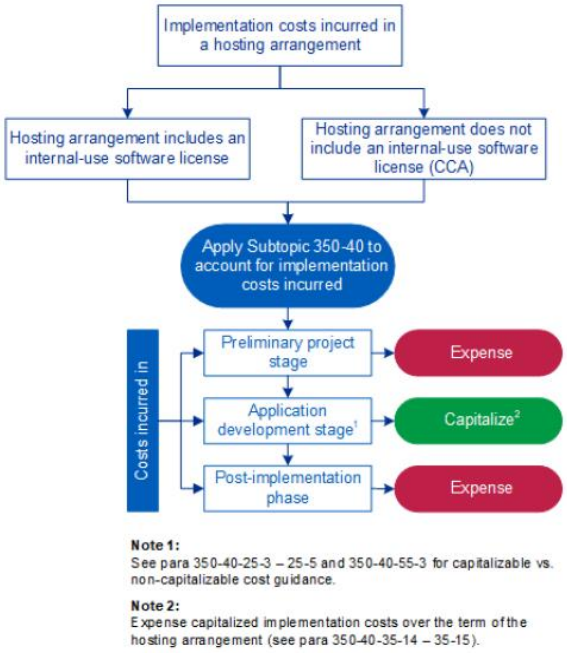
Therefore, based on the guidance in Subtopic 350-40, not all implementation costs will be deferred under ASU 2018-15. Costs incurred to implement a CCA will be deferred or expensed as incurred in accordance with the guidance for the capitalization or expensing of such costs under existing internal-use software guidance.

3.2.4 Recognition guidance in Subtopic 350-40

The amendments in ASU 2018-15 require an entity (customer) in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. The costs are capitalized or expensed depending on the nature of the costs and the project stage during which they are incurred, consistent with costs for internal-use software.

Costs to develop or obtain internal-use software that cannot be capitalized under Subtopic 350-40, such as training costs, business process reengineering and certain data conversion costs, also cannot be capitalized for a hosting arrangement that is a service contract. Therefore, an entity in a hosting arrangement that is a service contract must determine which project stage (that is, preliminary project stage, application development stage or post-implementation stage) an implementation activity relates to. Costs for implementation activities in the application development stage are capitalized depending on the nature of the costs, while costs incurred during the preliminary project and post-implementation stages are expensed as the activities are performed.

The following diagram summarizes the accounting for implementation costs incurred as part of a CCA after adopting ASU 2018-15.



The table below provides examples of implementation activities and general treatment of their costs when incurred.

Cloud SaaS	ASU 2018-15	Pre-ASU 2018-15
Interfacing (customer's environment)	**Defer**	**Defer**
Configuration	**Defer**	Expense
Coding	**Defer**	Expense
Testing	**Defer**	Expense
Customization of the hosted software	**Defer**	Expense
Training	Expense	Expense
Data conversion/migration	Expense	Expense
Business process reengineering	Expense	Expense

Generally, activities to configure and/or customize the hosted CCA service, whether incurred internally by the customer, by the cloud provider or an unrelated external party (e.g. consultant), would be part of the application development phase and eligible for capitalization.

3.2.5 Initial measurement guidance in Subtopic 350-40

An entity shall apply the guidance in Subtopic 350-40-30 *Initial Measurement* as though the hosting arrangement that is a service contract were an internal-use computer software project.

When an entity develops or acquires a software for internal use, the costs to be capitalized include the external direct costs of materials and services consumed in developing or obtaining the software,

payroll and payroll-related costs for employees who are directly associated with and who devote time to the software project, to the extent of the time spent directly on the project, and interest costs.

3.2.6 Subsequent measurement guidance in Subtopic 350-40

ASU 2018-15 requires the entity to expense the deferred implementation costs of a hosting arrangement that is a service contract over the term of the hosting arrangement. The term of the arrangement includes the non-cancellable period of the arrangement plus periods covered by:

– an option to extend the arrangement if the customer is reasonably certain to exercise that option;

– an option to terminate the arrangement if the customer is reasonably certain not to exercise the termination option; and

– an option to extend (or not to terminate) the arrangement in which exercise of the option is in the control of the vendor. For this period, the customer does not need to assess the likelihood of the vendor exercising the option — this period is included in the recognition period automatically.

The ASU requires companies to periodically reassess the recognition period for its deferred implementation costs. Therefore, companies need to have a process in place to do so, considering the same factors as it did when it determined its initial period.

The entity is also required to apply the existing impairment guidance in Subtopic 350-40 to the deferred implementation costs as if the costs were long-lived assets.

3.2.7 Presentation under ASU 2018-15

While US GAAP provides a practical expedient to treat implementation costs for cloud computing arrangements consistent with those for on-premise internal-use software, the presentation of implementation costs in the Statement of Financial Position and the manner in which they are presented in the Statement of Income are not identical.

In the Statement of Financial Position the implementation costs of a hosting arrangement that is a service contract cannot be presented as intangible assets. This is because they do not meet the recognition criteria for an intangible asset. Instead, implementation costs are deferred and presented in the same line item that a prepayment for the fees of the associated hosting arrangement would be presented (e.g., prepayments or prepaid expenses or other assets).

As deferred implementation costs are recognised in income over the period of the hosting arrangement the expense is not presented along with depreciation and amortization expense related to property, plant and equipment and intangible assets. Instead, deferred implementation costs will be presented in the same line item as the expense for the fees for the associated hosting arrangement. The line item is normally Operations, Management and Administration (“OM&A”) expenses for the industry.

3.3 IFRS

3.3.1 Accounting for fees paid in a CCA

Unlike US GAAP, IFRS does not have explicit guidance in respect of CCAs and the related implementation costs. However, unlike US GAAP, IFRS does have a comprehensive accounting

standard — IAS 38 Intangible Assets ("IAS 38") — which contains detailed criteria that must be met in order to recognize an intangible asset.

Paragraph 18 of IAS 38 requires the following criteria to be met to recognize an intangible asset:

- **The definition of an intangible asset.** An intangible asset is a resource that is both controlled by an entity and from which future economic benefits are expected to flow to the entity; and
- **The recognition criteria.** An intangible asset is recognized if it is probable that there are expected future economic benefits and the cost of the asset can be measured reliably.

Similar to preparers under US GAAP, IFRS preparers questioned the accounting for the costs incurred for a CCA arrangement and whether at the contract commencement date a customer is receiving a software asset or a service over the contract term. In March 2019, the IFRS Interpretations Committee ("the Committee") issued an agenda decision to address preparers concerns.

In the agenda decision, the Committee acknowledges that a customer receives a software asset if:

- the contract contains a software lease under the guidance in IFRS 16 Leases ("IFRS 16"); or
- the customer otherwise obtains control of the software under the guidance in IAS 38.

Further, if the contract does not contain a software lease or provide a software intangible asset, then the contract is a service contract.

When assessing whether a CCA contains a software lease, the Committee observed that a right to receive future access to the supplier's software running on the cloud infrastructure does not in itself give the customer any decision-making rights about how and for what purpose the software is used. Accordingly, a software lease does not exist as the requirements of IFRS 16 (paragraphs 9 and B9) are not met if a contract conveys to the customer only the right to receive access to the supplier's application software over the contract term.

When assessing whether a customer obtains control of the software in accordance with IAS 38, the Committee acknowledges that it is the "control" criteria that poses the greatest hurdle in recognizing an intangible asset for SaaS arrangements. This is because a right to receive future access to the supplier's software does not, at the contract commencement date, give the customer the power to obtain the future economic benefits flowing from the software itself and to restrict other's access to those benefits.

The Committee concluded that a contract that conveys to the customer only the right to receive access to the supplier's application software in the future is a service contact which is expensed as incurred. If the customer pays the supplier before it receive the service, the prepayment gives the customer a right to future service and would be recognized as a prepaid asset by the customer.

In the discussions leading up to the March 2019 agenda decision, the Committee generally agreed that some contracts might convey at contract commencement rights to software (beyond a right to receive future access) that create an intangible asset for the customer. For example, as part of the SaaS arrangement the customer might obtain rights that give it the ability to direct the use, and obtain the benefits from use, of software that is delivered to the customer at contract commencement. In that case, the customer would have power to obtain the future economic benefits flowing from the rights and to restrict the access of others to those benefits and, thus, would control an intangible asset.

As an example, the Committee noted that if a customer has a genuine right to possess the software and the ability to host that software on its own (or a third party) server, that the customer would likely

control a copy of the software and have the ability to recognize an intangible asset for the CCA, similar to the accounting for on-premise software that an entity may acquire.

When the criteria in IAS 38 to recognize an intangible asset are met, the asset is recognized at cost — being its purchase price together with any directly attributable cost of preparing the asset for its intended use (such as costs of employee benefits, professional fees and costs of testing to bring the asset to its working condition).

In our experience, the typical features of a CCA grant the customer a right to receive future access and thus, do not permit the recognition of an intangible asset. In practice, such arrangements are typically treated as a service contract under IFRS and the fees are expensed as incurred. However, terms and conditions of CCAs can vary and professional judgement will be required.

3.3.2 Accounting for implementation costs

Although the Committee noted that CCA contracts often include other services such as training, technical support, implementation, data migration, business process mapping and project management services, the Committee's deliberations did not address the accounting for such implementation costs. Likewise, the major global accounting firms currently have limited, if any, published guidance on the accounting for implementation costs associated with a CCA. However, when the underlying CCA itself represents a service contract, not an acquired intangible asset, it is generally difficult to support an argument that the related implementation costs can be capitalized as an intangible asset. This creates a difference between IFRS and US GAAP.

In our experience, it is important that an entity carefully evaluate the nature of the implementation costs incurred. In some limited cases, an entity's implementation costs may include the cost to develop an internal use piece of software — e.g., an interface software — for which control and legal title to that software belongs to the customer. Provided the recognition criteria in IAS 38 are met, it may be possible to recognize the costs of the internal use software as an intangible asset. Otherwise, in the absence of meeting the strict recognition criteria for an intangible asset, implementation costs are typically expensed as incurred in a hosting arrangement that is a service arrangement.

Configuration and customization costs can represent a significant portion of the CCA implementation costs incurred for many entities. In our experience, configuration is generally considered to be tailoring or configuring functionality that already exists in the software to meet the customer's specific needs, whereas customization involves the actual modification of the software code, a service that can only be performed by the cloud vendor (not another service provider). We believe an argument can be made that customization does not represent a separate stand-alone service, but rather is part of the cost of the SaaS as a whole. Accordingly, the cost of customization could be recognized over the term of the SaaS arrangement, rather than when incurred, if an entity pays upfront for such customization. In such situations, the customer would recognize a prepayment or prepaid asset (not an intangible asset).

As a result of the strict criteria that exist under IFRS for the recognition of an intangible asset and the lack of any practical expedient to override those requirements in order to treat the implementation costs for CCAs similar to those for on-premise software arrangements, the accounting for such costs under IFRS will be significantly different than their treatment under US GAAP.

The following table provides examples of implementation activities and general treatment of their costs when incurred under IFRS in a hosting arrangement that is a service contract (Cloud SaaS) compared to an on-premise software.

Typical treatment of implementation costs when incurred

Cloud SaaS	Cloud SaaS	On-premise software
Construction of a new interface software owned by customer	**Intangible**	**Intangible**
Configuration	Expense	**Intangible**
Testing	Expense	**Intangible**
Customization of the hosted software by the cloud provider	**Defer/Prepaid**	**Intangible**
Training	Expense	Expense
Data conversion/migration	Expense	Expense
Business process reengineering	Expense	Expense

3.4 Key findings

If the customer obtains only a right to receive access to the supplier's application software, the hosting arrangement will be accounted for as a service contract, with the fees paid being expensed as incurred. This is the accounting treatment under both US GAAP and IFRS. In a hosting arrangement that is a service contract, some implementation costs will be capitalized under US GAAP, whereas such implementation costs will typically be expensed as incurred under IFRS.

Given that the fees paid to access the supplier's application software are being expensed as incurred, that only certain implementation costs can be deferred under US GAAP, and that it is difficult under IFRS to have significant implementation costs deferred or recognized as an intangible asset, there is currently a disincentive in Canada for utilities to invest in CCAs. This reflects the fact that those "investments" fall out of the rate base. The recent guidance issued by the FASB and the Committee have not been effective at resolving the disincentive.

4 Stakeholder consultations

In this Chapter we summarize the findings from a series of interviews with external stakeholders on the challenges and opportunities associated with cloud computing.

4.1 Overview

Between November 2019 and February 2020, KPMG consulted 31 external stakeholders using a standardized interview approach, set of topics and questions. Interviews represented:

– 17 Canadian utilities;

– 6 Canadian and U.S. utility regulatory stakeholders;

– 5 cloud providers; and

– 3 industry associations.

KPMG also consulted internal subject matter experts.

We heard seven key messages throughout these consultations, which are described below. For emphasis, these observations are what stakeholders communicated to us during the stakeholder consultation process, not necessarily KPMG's final conclusions.

1. There is a broad spectrum of cloud adoption across Canadian utilities.
2. There was general consensus among the Canadian utilities consulted that they would have to move to the cloud sooner or later.
3. Cloud will be a key enabler of innovation in the utility sector.
4. The benefits of cloud investments are much broader than the cost savings alone, and include such things as improved flexibility, security and agility.
5. It remains difficult to directly compare the costs of cloud arrangements with those of traditional on-premise investments, and the benefits of cloud are hard to quantify with precision.
6. Among the utility stakeholders consulted, there was near unanimous consensus that Canadian utilities should be allowed to defer cloud costs and to earn a regulated return (consisting of a debt and equity return), similar to on-premise IT investments.
7. To date, few Canadian utilities have directly approached their local regulator and sought permission to defer expenses associated with the use of cloud solutions.

These seven research findings are described in more detail in the sub-sections below.

4.2 Research findings

4.2.1 Cloud adoption across Canadian utilities

There is a broad spectrum of cloud adoption across Canadian utilities. Some utilities have moved certain IT systems to the cloud and plan to continue with more cloud migrations. Others have started to move carefully to the cloud, and some have not yet begun this transition. None of the utilities

consulted have yet moved major IT systems to the cloud, such as Enterprise Resource Planning (ERP).

Representative applications that Canadian utilities have transitioned to the cloud include:

- email, word processing and other desktop applications (e.g., Office 365, Google G-suite)
- human resources systems (e.g., Workday Human Capital Management, SuccessFactors)
- procurement and supply chain systems (e.g., Ariba, Coupa)
- enterprise asset management systems (e.g., Maximo, Infor EAM)
- workflow systems (e.g., ServiceNow, BMC)
- customer-relationship management services (e.g., Salesforce, SAP CRM)
- travel management systems (e.g., Concur, Rydoo)
- geo-spatial applications (e.g. ArcGIS, Maptitude)
- customer billing systems
- general data storage
- analytics, virtual computing, storage, networking (e.g., Azure)

4.2.2 Inevitability of cloud transitions

There was general consensus among the Canadian utilities consulted that they would have to move to the cloud sooner or later. Increasingly the choice between on-premise and cloud options is narrowing. Many systems or solutions are now offered only in the cloud, cloud options are more frequently clearly superior, and increasingly vendors respond to competitive procurements solely with cloud-based proposals.

Representative comments:

- “In the not so distant future, everything will be in the cloud. There won’t even be ‘software’ in the sense we think about it today.”
- “Ten years from now, there might not even be software anymore.”
- “All software applications are moving to the cloud. In the future, you won’t be able to make on-premise investments anymore.”
- “We may not always have a choice between on-premise and cloud. There might only be the cloud option.”
- “Sometimes you don’t even have a choice anymore. Things are only offered in the cloud.”
- “We would like the majority of our systems to transition to the cloud over the next five years.”
- “Cloud elements or considerations are predominant in almost all of the new business products we’re looking at. The best solutions are often offered only on cloud.”
- “All industries are going this way.”

4.2.3 Key enabler of innovation

Cloud will be a key driver of innovation in the electricity utility sector. Cloud will become essential to meeting twenty-first century business needs and customer expectations. Utilities will need the cloud in order to achieve numerous public policy and commercial objectives, such as finding cost-saving efficiencies, driving greater collaboration among utilities, and adopting digital solutions to traditional utility business challenges — such as "smart" utility technologies (e.g., smart meters, smart appliances, smart asset management), distributed energy resources ("DER") and edge computing (i.e., distributed computing and data storage).

Representative comments:

– "This is where all the innovation is."

– "The innovation is only happening in the cloud, not in on-premise solutions. Therefore, the [electricity distribution] sector is at a disadvantage if it doesn't move to the cloud."

– "We're moving towards developing new business ideas that will go past our traditional utility business. A lot of those ideas often use or have licenses in the cloud. We're experimenting."

– "Cloud increases functionality. There are numerous advantages to being in the cloud. It's more flexible."

4.2.4 Improved flexibility, security and agility

The benefits of cloud investments are much broader than the potential cost savings alone, such as improved flexibility, security and agility. Stakeholders consistently articulated these additional benefits as reasons they have either moved certain systems to the cloud or are planning to do so in coming years.

Representative comments:

– "[On-premise investments] result in slower movement on upgrades. As the hardware ages, you more frequently address issues in patches. Overall, you get lower quality."

– "A driver to move to the cloud would be all of the advantages for our customers, like flexibility…"

– "Operationally, this is the right thing to do."

– "Our cloud strategy is linked to our open data strategy."

4.2.5 Cloud costs and benefits are hard to quantify and compare to on-premise systems

It remains difficult to compare the costs of cloud arrangements directly to those of traditional on-premise investments, and the benefits of cloud are hard to quantify with precision. Comparisons are difficult for several reasons:

– cloud computing arrangements have transparent, "all in" prices for a defined scope of services compared to the less transparent blend of hardware costs, operational costs and labour costs for on-premise investments;

– many cloud computing arrangements are for on-demand usage or availability-based payments compared to open-ended tailoring of on-premise investments; and

– cloud computing arrangements are for clearly defined terms whereas on-premise investments have clear up-front investments and sunk costs but unclear lifecycles and operations costs.

Nevertheless, a clear consensus exists among all stakeholders consulted that cloud is at least comparable in cost and, in some instances, cheaper and provides more value-for-money.

Stakeholders continually stated that cloud investments will do more to save ratepayers money in the long run and provide numerous other business benefits than comparable on-premise investments. While utilities are at different points in their transition to the cloud, these considerations are increasingly predominant in almost all IT decisions and/or new business products.

Representative comments:

– "The issue is comparing apples to apples."

– "[The costs and benefits] are case-by-case and client-by-client."

– "Cloud certainly makes costs more transparent. On-premise investments have so many hidden costs. When we move to cloud, it's all a fixed fee — we know what we're paying and what we're getting."

– "These [costs and benefits] are hard to quantify for regulators."

– "Cloud offerings are significantly less expensive than if the utility were to do it themselves."

– "Ongoing maintenance and upgrades of in-house systems increase as these systems become obsolete. Having this on the cloud ultimately would likely result in savings."

4.2.6 Canadian utilities should be allowed to defer or capitalize cloud costs and earn a regulated rate of return

Among the utility stakeholders consulted, there was near unanimous consensus that Canadian utilities should be allowed to defer cloud costs and earn a regulated return (consisting of a debt and equity return) similar to on-premise IT investments, which are part of utilities' capital budgets as opposed to OM&A. There was a strong desire to "level the playing field" between cloud and on-premise IT investments. Stakeholders stated that if the regulatory accounting treatment continues to treat cloud investments differently from on-premise IT investments, then it will slow the adoption of cloud in the utility context. In particular, as the costs of cloud adoption continue to increase due to larger and larger systems being transitioned to the cloud, the current OM&A regulatory accounting approach will increasingly serve as a barrier with unintended consequences.

Stakeholders noted that, since applications hosted in the cloud versus in on-premise equipment can serve roughly the same business purpose, the regulatory accounting treatment should treat these two delivery approaches in a similar way. Interviewees argued that the costs for the cloud solution simply have a different profile; they become ongoing costs instead of a one-time cost. In order to make the best decisions for ratepayers, the accounting treatment should not be a factor in management's decision-making. Stakeholders often noted that, for cloud services, current regulatory treatments have evolved slower than the technology itself.

Representative comments:

— "In the long run, this saves money for ratepayers. We should be recognized for making these investments and allowed to earn a return."

— "The logic should prevail. It makes sense that [cloud costs] should be deferred. Cloud serves the same purpose as if these servers were on-premise. The fact that they're in the cloud doesn't change their purpose."

— "If you don't update the regulatory treatment, you'll see utilities 'gaming' the system."

— "The concept shouldn't be that different from replacing an aging pole. We need to replace current [IT] systems. It's just that technology is way ahead of the regulators and accounting bodies in what that will look like in the future."

— "The nature of the investment has changed, but it's an investment in the same thing, nonetheless."

— "In order to make the best decision, we need to make [cloud and on-premise] more equal from a rate effect."

— "The purpose of a regulatory model is to put in place economic incentives and other signals where they might otherwise be absent, such as a monopoly… Utilities want to do the right thing, but they also don't want to be penalized for doing the right thing… If there are distortions in the [regulatory] model, there will be distortions in the [business] outcomes."

4.2.7 Limited engagement with regulators about capitalizing the cloud

To date, few Canadian utilities have directly approached their local regulator and sought permission to capitalize expenses associated with the use of cloud solutions. While the topic is important to the stakeholders consulted, the current costs of cloud investments are relatively small compared to other recent capital investments. While use of the cloud is an emerging business issue, it has not yet reached the point where it is often a large enough expense to prompt major focus in the regulatory process.

Interviewees welcomed the CEA's initiative to increase discussion about capitalizing the cloud, and they hope it leads to increased education, awareness and informed decisions among different sector participants. Stakeholders felt it would be important for the sector to speak with "one voice" on the issue.

Representative comments:

— "It's becoming a hotter topic now because we're anticipating more of these types of [cloud] costs coming down the pipeline."

— "Now is the perfect time for the sector to be discussing these issues with regulators."

— "Policies evolve slower than technological change. We need to adapt."

— "How do we avoid every jurisdiction having its own regulatory approach to this issue?"

— "It's good to keep this discussion going."

5 Jurisdictional review

In this Chapter we review developments in a number of US and Canadian jurisdictions in regard to alternative rate setting approaches for cloud computing, utility remuneration and similar topics (including alternative approaches for leases and DSM costs).

5.1 NARUC resolution

In November 2016, the National Association of Utility Regulatory Commissioners ("NARUC") — the U.S. national association representing state public service commissioners who regulate essential utility services — adopted a resolution encouraging state utility regulators to consider:[7]

> "whether cloud computing and on-premise solutions should receive similar regulatory accounting treatment, in that both would be eligible to earn a rate of return and would be paid for out of a utility's capital budget"; and
>
> whether "existing regulatory accounting rules may be interpreted, if appropriate, to allow for utilities to capitalize cloud-based software".

In the preamble to this resolution, NARUC noted:

> "WHEREAS, Under current guidelines, a utility may classify investments in legacy hardware and supporting on-premise software as a capital expense, on which it can receive a rate of return; however, if a utility invests in cloud-based technologies, it typically treats the investment as an operating expense, on which it does not receive a rate of return; and
>
> "WHEREAS, The disparity in accounting treatments between these two software approaches creates a regulatory incentive for utilities to invest in on-premise software solutions and creates unintended financial hurdles that hinder utilities from realizing the benefits that so many other industries are experiencing with cloud-based software;"

As noted in the quotation above, concerns over shareholder incentives, and specifically the loss of shareholder earnings associated with traditional capital investments, were a key factor in the adoption of the resolution.

Additional considerations in support of this resolution were expectations that cloud computing:

- is increasingly the preferred approach to the delivery of computing services across a variety of industries;
- may be an important tool in the realization of economic, social and environmental benefits of a smart grid; and
- can provide utilities with increased reliability and flexibility.

In parallel with, or subsequent to, the NARUC resolution noted above, developments have occurred in a number of US state jurisdictions, most notably:

[7] National Association of Utility Regulatory Commissioners, "Resolution Encouraging State Utility Commissions to Consider Improving the Regulatory Treatment of Cloud Computing Arrangements," sponsored by the Committees on Critical Infrastructure, Gas, and Water; adopted by the NARUC Committee of the Whole on November 16, 2016, available at: https://pubs.naruc.org/pub.cfm?id=2E54C6FF-FEE9-5368-21AB-638C00554476

– Illinois
– New York
– Pennsylvania
– California

Developments in these jurisdictions are reviewed in more detail in the sections below.

5.2 Illinois

5.2.1 Overview

In 2017, the Illinois Commerce Commission ("ICC" or "Commission") initiated a proceeding to consider rules relating to the regulatory treatment of cloud-based computing solutions in Illinois. The objective was to create a rule that would "level the playing field between on-premise and cloud-based computing systems by clarifying the regulatory accounting rules to provide comparable accounting treatment of on-premise and cloud-based computing systems."[8]

The related proceeding has evolved over time, with a long-history of consultations and some set-backs, as further outlined below.

After a series of consultations with various stakeholders, including utilities and consumer groups, the ICC proposed a rulemaking in May 2018. This rulemaking was submitted to the Joint Committee on Administration Rules ("JCAR" or "Joint Committee") in January 2019. In June 2019, the Joint Committee objected to the proposed rule-making, noting that it had "not yet received sufficient information regarding the economic impact of the rulemaking on affected ratepayers".[9]

Additional work followed and, in October 2019, the ICC adopted the proposed language of the new rule for "Regulatory Accounting Treatment for Third-Party Cloud-Based Solutions" (Part 289) and began the first notice period of its rulemaking process. The Commission summarized the benefits of the proposed rule as:

> "The Proposed Rule will promote additional benefits that cloud-based solutions can bring to consumers. The flexibility, efficiency, and scalability of cloud-based solutions will enable additional functions at lower costs and could improve reliability and resiliency… In addition, removing the disparity of accounting treatment between cloud and on-premise platforms allows utilities to maximize their investments by prioritizing the most efficient services at lower costs in the long run…"[10]

A high-level summary of the proposed change is as follows:

– Going forward, a public utility would be permitted to record as a regulatory asset and, subject to the ICC's determination of prudence and reasonableness in a rate case, include in its rate base

[8] ICC, Docket No. 17-0855, Staff Report to the Commission, "Regulatory Accounting Treatment for Cloud-Based Computing Systems", June 17, 2019, p.1.
[9] Illinois Commerce Commission, Documents for 17-0855, First Notice Order, "Order – First Notice," filed by Heather Jorgenson, Administrative Law Judge, posted 10/10/2019, available at: https://www.icc.illinois.gov/docket/files.aspx?no=17-0855&docId=292097
[10] ICC, Docket No. 17-0855, First Notice Order, "Order – First Notice," filed by Heather Jorgenson, Administrative Law Judge, posted 10/10/2019.

the costs associated with cloud-based arrangements that would otherwise be recorded as utility plant if the costs were for an on-premises computing solution, rather than a third-party cloud-based computing solution.[11]

The following additional requirements need to be met:

– The utility has the burden to prove, in any case seeking cost recovery, that the costs recorded as a regulatory asset would be recorded to a utility plant account if these costs were for an on-premise computing solution.

– The public utility would need to ensure that each regulatory asset is associated with a specific service contract. Those contracts would be required, to the extent possible, to itemize various costs (e.g., development, coding, testing, licenses, hardware, customization, maintenance or support of the solution's operation, training, network connectivity, data storage, any overhead).

– Each regulatory asset would be amortized individually over a period that begins with the in-service date and ends at the conclusion of the service contract term.

We note that the ICC rulemaking does not contemplate that costs be amortized over a period that would extend beyond the contract term. This option had been proposed by the Advanced Energy Economy Institute in consultations leading up to the new rule.

5.2.2 Background

Because of delays in implementation of the proposed rules, Illinois does not offer any evidence on the impact of alternative rate-making approaches in practice. However, consultations in the course of the rule-making do provide interesting perspectives from utilities and other industry stakeholders. We have further summarized some of the content of deliberations below.

In 2016, the Commission initiated a notice of inquiry into whether "utility investment in cloud computing is prudent and whether leveling the playing field between cloud and on-premise solutions would encourage utilities to make the most cost-effective investments".[12] In response, 20 utility and non-utility stakeholders submitted comments.

In the notice of inquiry, the Commission asked stakeholders to comment on 5 topics related to cloud computing arrangements in the utility context:

1. Cost
2. Reliability
3. Cyber security
4. Regulatory and other barriers
5. Additional benefits of cloud deployment

Stakeholders presented numerous perspectives reflecting a diversity of backgrounds, including those from power, water and gas utilities; software providers; industry associations; and the Attorney General of the State of Illinois. Stakeholder comments were exclusively qualitative. Stakeholders did

[11] Illinois Commerce Commission, Docket No. 17-0855, First Notice Order, Attachment A, proposed Section 289.40, pp. 3-4.
[12] Illinois Commerce Commission, Documents for 17-0855, Initiating Order, "Notice of Inquiry Regarding the Regulatory Treatment of Cloud-Based Solutions," filed by Brien Sheahan, Commissioner, posted 12/16/2017, available at: https://www.icc.illinois.gov/docket/files.aspx?no=17-0855&docId=259555

not provide quantitative or financial analysis. As a result, the Commission's 124-page final report is largely rhetorical and subjective. This reflects the open-ended nature of the Commission's inquiry, as opposed to specific examples or modeling presented in rate hearings.

Stakeholder comments can be summarized as reflecting general consensus on the following topics:

- Costs:
  - Costs are difficult to compare directly between on-premise IT systems and cloud arrangements. Therefore cost-benefit trade-offs will differ significantly on a case-by-case basis.
  - Numerous stakeholders stated that cloud costs are, at a minimum, comparable with those of on-premise IT systems but, in many cases, significantly lower. There was also a perception of considerably more value derived from cloud arrangements (e.g., flexibility, agility, real-time upgrades).
- Cyber security:
  - Cyber security was viewed as at least as strong for cloud arrangements as for on-premise IT systems. Stakeholders stated that cyber security may even be stronger in cloud arrangements since "cyber security is core to the business model of cloud providers".
  - Stakeholders emphasized that cloud arrangements enable effective management of cyber security and data privacy risks; however cloud arrangements do not reduce or eliminate them.

There was less consensus among stakeholders on the following topics:

- Reliability:
  - Perspectives ranged from no significant differences for reliability between cloud arrangements and on-premise IT systems to cloud arrangements leading to significant reliability benefits.
- Regulatory and other barriers:
  - Stakeholders disagreed about whether the current regulatory accounting treatment of cloud arrangements as OPEX versus on-premise IT systems as CAPEX discouraged Illinois utilities from making otherwise prudent decisions about deploying cloud-based solutions provided by third-party vendors.
  - Stakeholders disagreed about the perceived disadvantages for utilities of treating cloud costs as OPEX versus CAPEX outweighed the advantages.
  - Numerous arguments were made for and against three primary positions that:
    - The current accounting treatment creates an un-level playing field between cloud arrangements and on-premise IT systems because both serve identical purposes;
    - There is not a clear advantage to either type of accounting treatment; and
    - Utility decisions on these topics must be evaluated on a case-by-case basis depending on the specific terms of the arrangement.

Several of the utilities and joint software providers[13] stated that "simple fixes" could potentially be used to address the rate-making imbalance, such as "…most or all of the costs of cloud-based software could be included in FERC USofA Account 303, 'Miscellaneous Intangible Plant'".[14]

The notice of inquiry's final report concluded that "…the Commission should consider initiating a rulemaking to consider leveling the playing field between on-premise and cloud-based computing systems by updating and clarifying the regulatory accounting rules to provide comparable accounting treatment of on-premise and cloud-based computing systems". [15]

The Attorney General's office ("the AG Office") raised numerous objections to assertions that the accounting treatment "…discourages utility investment in cost-effective software solutions such as data analytics and off-premises or cloud computing".[16] Objections by the AG Office were the cause of delays in implementing this initiative, as the AG Office intervened on several occasions to block the initiative on procedural grounds.

5.3 New York

5.3.1 Overview

Between 2015 and 2016, the State of New York conducted a comprehensive evaluation of its regulatory paradigm that included several options for changes to the regulatory accounting treatment of distributed energy resources ("DER"). That proceeding offers insights into the broader topic of capitalizing the cloud because, like the cloud, DER arrangements often involve utilities balancing trade-offs between making on-site capital investments versus ongoing third-party operating expenditures — in particular, "…valuing alternative resources by focusing on the traditional costs that can be avoided."[17]

Reforming the Energy Vision ("REV") is New York State's current long-term energy vision document. REV is a multi-agency initiative that involves participation by the State's entire energy sector, including the New York Public Service Commission ("NYPSC"), the New York Energy Research and Development Authority, the New York Power Authority, and the Long Island Power Authority. One of its several objectives focuses on a "…need to reform the utility business model and to align ratemaking practices with an evolving set of regulatory and policy objectives."[18]

Specifically, "The REV proceeding envisions the transformation of electric distribution utilities from serving unmanaged loads, using traditional infrastructure, to dynamically managing a platform that provides ratepayers with the greatest benefits at the lowest cost, while also maximizing consumer options."[19]

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[13] "Joint software provider parties" was the term used by the Commission to describe the following stakeholders as a group: Advanced Energy Economy Institute, Advanced Energy Management Alliance, EnergyHub, EnergySavvy, EnerNOC, Inc., FirstFuel Software, Inc., Opower, Inc., and Oracle.
[14] Ibid.
[15] Ibid.
[16] Ibid.
[17] New York Public Service Commission, Case 14-M-0101, "Staff White Paper on Benefit-Cost Analysis in the Reforming Energy Vision Proceeding," filed by Theodore Kelly, posted 07/01/2015
[18] New York Public Service Commission, Case 14-M-0101, "Order adopting a ratemaking and utility revenue model policy framework," filed by Department of Public Service, issued and effective 05/19/2016, p. 104.
[19] New York Public Service Commission, Case 14-M-0101, "Staff White Paper on Benefit-Cost Analysis in the Reforming Energy Vision Proceeding," filed by Theodore Kelly, posted 07/01/2015

Changes proposed under REV include the following:

– Utilities will be permitted to earn a return on some types of operating investments within the current accounting system.

– For pre-paid leases of IT applications, the unamortized balance of the pre-payment can be included in rate base and earn a return. This should presumably cover cloud applications.

Other relevant developments in New York include:

– tying incentive payments to project savings;

– adjustment of the claw-back mechanism; and

– use of an incentive adder.

These are discussed further below.

5.3.2 Background

5.3.2.1 Incentive mechanisms based on cost savings

For Non-Wires Alternatives ("NWAs") New York permits earnings incentives that are based on providing utility shareholders with a 30% share of the NPV benefits of such projects.[20]

This mechanism may be relatively complex to implement and administer, as it will require estimates of likely cost savings and such estimates are often the subject of disagreement amongst stakeholders. In theory, such an approach could be applied to cloud computing projects, although it may be difficult to gain stakeholder acceptance unless project cost and benefits are universally agreed upon.

5.3.2.2 Adjustment of claw-back mechanism

One topic of discussion in New York in regard to promoting non-traditional solutions has been the implications of "claw-back" mechanisms.

One feature of New York and some other regulatory jurisdictions is that, when utilities have not spent their projected capital budget, some amount of prior revenue is "clawed-back" in the next rate setting process. Claw-backs are used to return carrying charges embedded in rates for projects or amounts that were expected to be in Rate Base during the prior period, but which were not actually in Rate Base because forecast amounts went unspent. This claw-back mechanism is relevant where rates are set on a forward test year basis, and then trued-up to reflect actual capital spending. The rationale for a claw-back is that, without the mechanism, utilities would otherwise try to underspend relative to forecast, possibly with detrimental impacts on service quality, reliability and system asset condition.

The claw-back mechanism can be a strong incentive for utilities to ensure that they spend all of their capital budgets. It can thereby serve as a disincentive for projects that substitute operating expenditures for capital expenditures. Accordingly, a staff report recommended that the claw-back mechanism not be applied when a project in the forecast capital budget was supplanted by DER or

[20] Advanced Energy Economy Institute, "Utility Earnings in a Service-Oriented World", January 30, 2018, p. 63.

operating expenditures in a cost-effective manner.[21] In other words, the utility should be allowed to retain carrying costs associated with unspent funds. This proposal was accepted by the Commission.

Some observers expressed concern that reform of the claw-back mechanism would present a risk that utilities would inflate their initial capital estimates. In accepting the Staff report recommendation, the NYPSC acknowledged this risk but suggested it could be countered by analysis by Staff and intervenors of the reasonableness of utilities' estimates.[22]

Cloud projects, by substituting third-party service payments for capital investments in in-house IT systems, may exacerbate capital spending shortfalls. Hence, a similar adjustment could be applied when cloud projects replace capital on a cost-effective basis. This type of adjustment is only relevant when such claw-back mechanisms are in place in the underlying rate setting process.

5.3.2.3 Use of an incentive adder

There is precedent in New York for the use of incentive adders and for the capitalization of operating costs. In the case of the Brooklyn-Queens Demand Management ("BQDM") program, the Commission provided for the amortization of all capital and operating costs over a ten-year period (with carrying charges) and provided for an incentive adder.[23] In reviewing this precedent, a Staff report noted:

> "If utilities are able to see operating resources as an earning opportunity on a par with capital spending, they will have no disincentive to procure DER." [24]

The BQDM program consisted of a number of non-traditional alternatives to upgrading of a new area substation. Elements included a new demand management program to help reduce summer peak loads, and capacitor bank installations and load transfers. These initiatives would help defer construction of a new substation by two years.

The incentive adder approved by the Commission took the form of a 100 basis point (bps) increase in ROE for expenditures related to the project. The adder was tied to specific metrics as follows:[25]

- 45 bps was tied to actually achieving forecast demand savings of 41 MW from the alternative customer-side measures that were proposed;
- 25 bps was tied to increasing the diversity of DER in the market (by contracting with more individual DER suppliers, rather than a few larger ones); and
- 30 bps was tied to the company's ability to assemble a portfolio of solutions that achieves a lower $/MW than the base case investment solution presented. (In essence, the value of this adder was tied to the percentage reduction in costs per MW that was achieved with the BQDM program relative to traditional investments.)

[21] New York Public Service Commission, Case 14-M-0101, "Staff White Paper on Ratemaking and Utility Business Models," July 28, 2015., p.41.
[22] New York Public Service Commission, Case 14-M-0101, "Order adopting a ratemaking and utility revenue model policy framework," filed by Department of Public Service, issued and effective 05/19/2016, p. 100.
[23] The Régie de l'énergie in Quebec has also allowed Hydro Quebec to defer CDM costs and amortize them over 10 years. Other provinces have also allowed the same regulatory treatment.
[24] New York Public Service Commission, Case 14-M-0101, "Staff White Paper on Ratemaking and Utility Business Models," July 28, 2015., p.42.
[25] New York Public Service Commission, Case 14-M-0101, "Order establishing Brooklyn/Queens Demand Management Program," issued and effective 12/12/2014, Appendix B.

Based on our review of the decision, it appears that calculations used to implement this adder are fairly complex. There was no specific rationale cited for the aggregate 100 bps amount underlying the adder.

Discussions with staff at the Commission suggest that it is moving away from ROE incentives as structured above. A concern is that these incentives do not provide an incentive to reduce the costs of the alternative. As a result, the Commission prefers incentives based on the savings that are expected to be achieved. This requires good estimates of the costs of the traditional solution.

5.4 California

5.4.1 Overview

In December 2016, the California Public Utilities Commission — the regulator of privately owned public utilities in the State of California — implemented a rulemaking that allows utilities to receive a 4% adder on the total cost of periodic payments for DER.

The purpose of the so-called "DER adder" is to incentivize utility adoption of innovative DER technologies and "compensate for avoided earnings on infrastructure assets."[26] That proceeding may offer insights into the broader topic of capitalizing the cloud because, like the cloud, DER arrangements involve utilities balancing trade-offs between making on-site capital investments versus ongoing third-party operating expenditures. However, we have found no evidence or analysis to support the 4% value that is used to calculate the adder.

5.4.2 Background

Beginning in 2015, California embarked on numerous initiatives to address the causes of climate change by reducing greenhouse gas emissions related to power generation. The California Legislature enacted several laws committing the state to formal targets for emissions reduction targets, adoption of renewable power generation and increasing energy efficiency. Central to these efforts was legislation that required significant reform of utility distribution planning, investment and operations — geared towards encouraging California utilities to increase the integration of distributed energy resources.

5.5 Pennsylvania

5.5.1 Overview

In 2018, the Pennsylvania Public Utility Commission ("PPUC") recommended approval of a joint settlement agreement developed by parties in a proceeding to establish base rates for Duquesne Light Company ("Duquesne").[27]

[26] California Public Utilities Commission, "Actions to Limit Utility Costs and Rates: Public Utilities Code Section 913.1 Annual Report to the Governor and Legislature," May 2018.
[27] Pennsylvania Public Utility Commission, Recommended Decision, Docket Nos. R-2018-3000124 et. al., p. 30.

One of the features of the settlement agreement is that it allows the capitalization of certain cloud computing software costs. These software costs would be capitalized if installed on company computers, but cannot be capitalized without PPUC approval with the advent of cloud computing.

Under the settlement, Duquesne will be permitted to capitalize the development costs for cloud-based information systems. These costs will be recorded as a regulatory asset at the time such costs are incurred. These will then be amortized after the systems are placed in service and included in the company's depreciation claim. Unamortized balances will be included in rate base.

5.5.2 Background

In a public statement supporting the settlement, the Chairman of the PPUC highlighted her support for two specific provisions included in the settlement. One provision related to an electric vehicle pilot project. The other provision highlighted by the Chairman dealt with cloud computing.

In respect of the cloud provision, the Chairman noted:

> "It is the duty of this Commission to construct a regulatory climate which accommodates new technologies and capabilities in order to provide utilities with the tools necessary to satisfy and empower its customers. Permitting for the capitalization of cloud-based development costs aligns the interests of utilities with the new expectations of utility customers. Further, this accounting treatment is consistent with the resolution passed by the National Association of Regulatory Utility Commissioners related to the regulatory treatment of cloud computing arrangements.
>
> I applaud Duquesne and the parties in this proceeding for putting these proposals before the Commission and I am pleased to provide my support."[28]

It appears that the provision is limited to development costs for cloud computing arrangements, and does not contemplate capitalization of service-based consumption charges.

5.6 Federal Energy Regulatory Commission

5.6.1 Overview

The Federal Energy Regulatory Commission ("FERC" or the "Commission") has recently issued guidance for regulatory purpose that permits utilities to capitalize certain implementation costs in a CCA that is a service contract, which aligns the accounting with the guidance on capitalizing costs associated with developing or obtaining internal-use software.

5.6.2 Background

FERC staff received many inquiries from utilities regarding clarification on how to apply ASU 2018-15 *Accounting for Implementation Costs in a CCA that is a Service Contract* within the framework and regulatory intent of the FERC's existing accounting requirements. The guidance issued by the FERC on December 20, 2019[29] states:

– "As discussed herein, for regulatory accounting and reporting to the Commission, jurisdictional entities will be permitted to capitalize certain implementation costs and to amortize those costs

[28] Pennsylvania Public Utility Commission, Statement of Chairman Gladys M. Brown, Docket Nos. R-2018-3000124 et. al.
[29] https://ferc.gov/enforcement/acct-matts/docs/AI20-1-000.pdf

over the term of the associated cloud computing arrangement. However, in capitalizing these costs, jurisdictional entities must adhere to the regulations related to plant construction costs set forth under Part 101, Part 201, and Part 367 of the Commission's regulations. Jurisdictional entities must also follow the guidance provided herein with regards to the accounts they should use to record the capitalized costs and the related amortization expense. Service fees and other non-capital costs for the cloud computing arrangement are generally recorded as an expense."

– "The accounting guidance included herein is intended to result in consistent accounting for the same types of costs incurred for cloud computing arrangements and internal-use software projects for accounting and financial reporting to the Commission."

– "Question: How should jurisdictional entities capitalize implementation costs related to cloud computing arrangements?

  Response: Implementation costs related to cloud computing arrangements are similar to the costs incurred to develop internal-use software and should be accounted for on the same basis. Jurisdictional entities have historically determined capitalizable internal-use software costs in a manner consistent with the requirements of ASC 350-40, which is an acceptable approach for accounting and financial reporting to the Commission. Accordingly, it is also appropriate for jurisdictional entities to determine capitalized implementation costs related to cloud computing consistent with ASC 350-40. Examples of implementation costs that may be capitalized include upfront costs to integrate with on-premise software, coding, configuration, and customization."

– "Question: What accounts should jurisdictional entities use to record capitalized implementation costs related to cloud computing arrangements for Commission accounting and reporting purposes?

  Response: Jurisdictional entities should record capitalized implementation costs associated with cloud computing arrangements as a utility plant asset, consistent with the Commission's accounting requirements for internal-use software. Accordingly, jurisdictional entities should record capitalized implementation costs in Account 303 (Miscellaneous Intangible Plant), provided such costs are not specifically provided for in other utility plant accounts. For example, public utilities are required to record software used to support regional transmission and market operations in Account 383 (Computer Software). Accordingly, a public utility's capitalized cost related to cloud computing arrangements for regional transmission and market operations should be recorded in Account 383."

– "Question: What accounts should jurisdictional entities use to record the amortization or depreciation of capitalized implementation costs related to cloud computing arrangements?

  Response: Jurisdictional entities should amortize or depreciate capitalized cloud computing costs consistent with the requirements of the utility plant accounts in which they are recorded. Specifically, the amortization of capitalized cloud computing costs recorded as intangible utility plant should be recorded in Account 404 (Amortization of Limited-Term Electric Plant) for public utilities and centralized service companies, and Account 404.3 (Amortization of Other Limited-Term Gas Plant) for natural gas companies. The amortization of capitalized cloud computing costs not classified as intangible utility plant should be recorded in Account 403 (Depreciation Expense)."

5.7 Ontario Energy Board Consultation

5.7.1 Overview

In March 2019, the Ontario Energy Board ("OEB") began consultations on utility remuneration and responding to DER.[30] The consultation will consider guiding principles, objectives, challenges and opportunities related to these topics. Specifically:

– **Utility remuneration:** "The OEB is initiating a consultation to identify how to remunerate utilities in ways that make them indifferent to traditional or innovative solutions, better supports their pursuit of least cost solutions, strengthens their focus on long-term value and requires them to reflect the impact of sector evolution in their system planning and operations."

– **Responding to Distributed Energy Resources:** "The OEB is initiating a consultation to develop a more comprehensive regulatory framework that facilitates investment and operation of DERs on the basis of value to consumers and supports effective DER integration so the benefits of sector evolution can be realized."

5.7.2 Background

These initiatives, which are being carried out in coordination with each other, stem from the OEB's 2017 "Strategic Blueprint", entitled *Keeping Pace with an Evolving Energy Sector*. This document described the OEB's "commitment to modernize its approach to regulation in order to keep pace with an evolving energy sector."[31]

According to the OEB's letter to stakeholders commencing the consultations, "Both initiatives are intended to:

– Facilitate lower costs, better service and more choice for customers by encouraging utilities and other service providers to embrace innovation in their operations and the products they offer to consumers

– Secure the benefits of sector transformation and mitigate any adverse consequences"

These consultations remain ongoing.

[30] Ontario Energy Board, EB-2018-0287 and EB-2018-0288, see: https://www.oeb.ca/industry/policy-initiatives-and-consultations/utility-remuneration and https://www.oeb.ca/industry/policy-initiatives-and-consultations/responding-distributed-energy-resources-ders

[31] Ontario Energy Board, Letter, "Re: Utility Remuneration and Responding to Distributed Energy Resources Consultation Initiation and Notice of Cost Awards Process," Board File Numbers: EB-2018-0287 and EB-2018-0288, dated March 15, 2019, available at: http://www.rds.oeb.ca/HPECMWebDrawer/Record?q=CaseNumber=EB-2018-0288&sortBy=recRegisteredOn-&pageSize=400

5.8 The Régie de l'énergie du Québec

5.8.1 Overview

The Régie de l'énergie du Québec ("Régie") has authorized Énergir to create deferral accounts to capitalize certain implementation costs for a cloud computing arrangement that is a service contract.[32]

5.8.2 Background

Énergir is currently reporting under US GAAP. Énergir's rate application for the period starting October 1, 2018 was filed before the issuance of the ASU 2018-15 but after the Exposure Draft ("ED") had been issued.

Rate application filed by Énergir on November 1, 2017.

– Énergir asked the Régie for authorization to include the initial costs of configuring and customizing a CRM solution into the rate base, as well as their amortization over a period of 10 years.

– Énergir also requested the Régie to authorize, generically, the inclusion of the initial configuration and customization costs into the rate base of any future cloud computing project and their amortization over a period of five years, except in the case where the Régie authorizes a different period.

Énergir's arguments are summarized below.

– Under US GAAP, the accounting treatment of the initial configuration and customization costs currently differs if they are incurred to modify the on-premise software, in order to make it compatible with the new solution, or to customize or configure the SaaS software.

– The fact of not capitalizing or amortizing these implementation costs over the useful life of the IT solution represents a challenge for regulated companies. The financial burden is thus assumed by the current customers while the future customers, although benefiting from the solution, will not have to bear the costs.

– In addition, Énergir indicated that the FASB recently published an ED which proposes the capitalization of the costs of configuration and customization of a SaaS software, as well as the amortization over the period of the contract of cloud solution service.

– Énergir submitted that the FASB's position is in line with its own, that these costs are linked to future economic benefits from the service contract and that they should be capitalized.

The Régie issued a Decision to Énergir on November 6, 2018 which stated that:

– The Régie notes the FASB's position set out in the ED that the initial configuration and customization costs are linked to future economic benefits from the service contract and should be capitalized.

– The Régie also notes that Énergir's proposal allows configuration and customization costs to be accounted for in a way that expresses the underlying economic reality.

[32]See Decision on pages 19-21.
http://publicsde.regie-energie.qc.ca/projets/424/DocPrj/R-4018-2017-A-0062-Dec-Dec-2018_11_06.pdf

– With respect to the amortization of the CRM project, the Régie considers that the 10-year term proposed by Énergir is reasonable in the circumstances, while respecting the spirit of the ED.

Considering the above,

– The Régie authorized the inclusion into the rate base of all the initial configuration and customization costs specific to the CRM project, and their amortization over a period of 10 years.

– Regarding future cloud computing projects, the Régie authorized, from October 1, 2018, the inclusion into the rate base of all the initial configuration and customization costs and their amortization over a period of five years, except in cases where the Régie has authorized a different amortization period.

5.9 Leases

5.9.1 Overview

The OEB has recently issued a Decision and Order allowing Toronto Hydro to include the lease assets in the rate base and to earn an interest at the rate of return authorized by the OEB on the rate base.

5.9.2 Background

Toronto Hydro has recently adopted and applied IFRS 16 *Leases* effective January 1, 2018 as required by the International Accounting Standards Board.

As part of their application for electricity distribution rates beginning January 1, 2020 until December 31, 2024 (the "Application"), Toronto Hydro requested that the lease assets be included in the rate base and be eligible to a return.

The OEB's Decision and Order related to the Application was issued on December 19, 2019. The key discussions are as follows:

– "OEB staff stated that with respect to IFRS 16, the new standard effectively eliminated the classification of an operating lease and now requires that virtually all lease arrangements be accounted for as capital leases. Capital leases are recognized as assets on the balance sheet and depreciated over their lease term. Prior to IFRS 16, lease costs associated with operating leases were recovered in rates as part of OM&A expense."

– "OEB staff noted that as a result of IFRS 16, operating lease costs that were previously recovered in rates through OM&A will now form part of rate base and be eligible to attract a return. This treatment is consistent with how capital leases have historically been treated for ratemaking purposes.[33]"

– "In its reply argument, Toronto Hydro submitted that the proposed accounting changes should be approved by the OEB as proposed."

[33] Article 425 of the OEB's Accounting Procedures Handbook for Electricity Distributors states that "A "finance" lease is essentially similar to a "capital" lease under previous Canadian GAAP. Accordingly, a finance lease will be given ratemaking consideration for inclusion in rate base." https://www.oeb.ca/oeb/_Documents/Regulatory/Accounting_Procedures_Handbook_Elec_Distributors.pdf

Findings:

– "Other than OEB staff, there were limited submissions on the accounting changes. The changes were driven by revisions introduced by the International Accounting Standards Board."

– "The OEB accepts the accounting changes for regulatory purposes."

5.10 Demand Side Management

5.10.1 Overview

Federal and provincial governments, as well as many US states, have issued policies to encourage energy conservation. Demand Side Management ("DSM") programs have been approved by regulators across North America to support these conservation policies. The policies and programs have evolved over the years to encourage energy efficiency, greenhouse gas emissions reduction, and the development and use of innovative technologies that support these goals.

5.10.2 Background

Decisions issued by the Régie related to DSM costs.

The Régie has allowed Hydro Québec ("HQ")[34] and Énergir[35] to create a deferral account for the costs incurred in connection with energy efficiency initiatives. The capitalized costs are deferred and amortized over a period of 10 years. The deferral account is included in the rate base and earns interest at the rate of return authorized by the Régie on the rate base.

Decisions issued by the BCUC related to DSM costs.

The British Columbia Utilities Commission ("BCUC") has allowed Fortis BC[36] and BC Hydro and Power Authority[37] ("BC Hydro") to create a deferral account for the costs incurred in connection with DSM programs. The capitalized costs are deferred and amortized over a period of 10 years for Fortis BC and 15 years for BC Hydro.

[34] See note 3 to the 2018 consolidated financial statements of Hydro Quebec.
http://www.hydroquebec.com/data/documents-donnees/pdf/annual-report.pdf

[35] See note 5 to the 2019 consolidated financial statements of Énergir https://www.sedar.com/CheckCode.do

[36] https://www.ordersdecisions.bcuc.com/bcuc/decisions/en/item/364350/index.do

[37] See section 3.5.2 of the Decision issued on March 1, 2018
https://www.ordersdecisions.bcuc.com/bcuc/decisions/en/item/306836/index.do
and article 1 for the definition of rate base Direction No. 7 to the BCUC
http://www.bclaws.ca/civix/document/id/loo102/loo102/28_2014

6 Policy evaluation

In this chapter, we provide an assessment of policy considerations and the advantages and disadvantages of alternative approaches for the rate treatment of cloud computing.

6.1 Evaluation criteria

In evaluating policy options and alternative rate-making treatments, it is important to define the criteria that will be considered in the evaluation. Relevant considerations are as follows:

- **Incentives for efficiency.** Policies should provide utilities with incentives to appropriately manage IT systems and costs, and to make optimal decisions regarding IT systems. This is important for ensuring that costs paid by consumers are ultimately (i) as low as possible; (ii) consistent with reliable, secure and effective service; and (iii) in line with anticipated benefits.
- **Consistent with good cost allocation practice.** Policies should result in an appropriate allocation of costs, both across time periods and across different classes of consumers. Good cost allocation practice generally implies that costs are matched with benefits. Those who benefit from a service, or who cause the associated costs to be incurred, should bear those costs.
- **Ease of administration.** Policies should be easy to implement and administer. They should not entail undue costs, for example, for tracking and oversight.
- **Impacts on utilities' financial position.** Policies should be consistent with the desire to maintain utilities' financial health and should not interfere with their ability to raise investment capital for service improvements.
- **Impacts on regulatory oversight.** Any policy should support regulators' ability to review the prudency of IT spending.
- **Effectiveness.** Any incentive policy that results in additional costs for consumers should clearly be effective: it should induce changes in behaviour relative to the baseline level. It should not reward behaviour that is likely to have occurred anyway. Another way of stating this is that the policy should have few "free riders".

6.2 Policy considerations

Prior to detailed discussion of the various rate-setting options, we provide some initial discussion of the policy considerations noted above in the context of the alternative rate-setting approaches for Cloud computing.

6.2.1 Incentives for Efficiency

The options examined in this report typically help to offset some of the lost earnings that utility shareholders experience when they adopt solutions that replace a capital investment with a stream of operating expenses. The objective of the alternative rate-making treatments is therefore to reduce the disincentive that shareholders have when evaluating cloud options. Alternative options should therefore promote efficiency, by overcoming potential hurdles to cloud adoption.

Efficiency could be compromised if the incentives are so strong that they lead to utilities making sub-optimal decisions in order to receive the incentive. Regulators will still need to evaluate the prudence

of utility decisions. Further incentives should be moderate in the context of the overall utility business size.

6.2.2 Consistent with good cost allocation practice

Rate making options that defer the recovery of costs from consumers, in order to allow shareholders to earn a return, may have either a positive or negative impact on cost allocation patterns:

– Options that allow implementation costs to be deferred, and then recovered over the period of the contract, will generally result in a more defensible approach to cost allocation. Costs are better matched to benefits and recovered more evenly through the period of service.

– Options that defer recovery of annual payments to later periods appear to result in a less defensible allocation of costs among time periods. Cost recovery may be skewed to later periods in the contract term, or may even extend beyond the term.

Many other options, such as pre-payment or an earnings uplift, have no significant impact on cost allocation patterns. Costs that are prepaid are amortized over the period of the contract, meaning that charges to consumers are relatively even.[38] Consumers pay a relatively even amount even though, from utility investors' perspectives, there is a large cash outflow in the initial year.

6.2.3 Ease of implementation

Options that introduce differences between accounting for financial reporting versus rate-making purposes introduce some additional administrative complexity. This is probably manageable given utilities' familiarity and experience with regulatory assets and liabilities generally.

6.2.4 Impacts on utilities' financial position

Options that entail the capitalization of cloud computing costs, and hence deferral of cost recovery, will generally increase utilities' financing needs and hence their outstanding debt and equity capital. For incentives relating to cloud computing costs, we do not expect that such additional debt will have an undue impact on utilities' financial position. Computing and IT costs are typically a relatively small (although not insignificant) portion of utility capital budgets. Hence, deferral of the recovery of cloud computing costs should not have large impacts on utility financial position.

6.2.5 Impacts on regulatory oversight

In many jurisdictions, regulators have requested detailed disclosure of the costs for which special rate treatment has been applied. This is to help regulators monitor the use of these incentive mechanisms or alternative rate treatments. To the extent that regulators put in place such rules on disclosure, incentives can facilitate and enhance regulatory oversight.

[38] It should be noted that charges will be somewhat higher in early years because the unamortized book value of the asset associated with prepaid expenses, and hence the carrying charges associate with this element of rate base, are higher in these years. Charges to consumers are therefore not flat, but they are much flatter than the profile of cash flows, which has a large cash outflow in the first year as a result of the prepayment.

6.2.6 Effectiveness

As noted, as key test of effectiveness is that the policy encourage changes in behaviour. As the prevalence of and familiarity with cloud computing increases, the need for incentives to induce changes in behaviour may decline.

Nevertheless, alternative rate making approaches may still be desirable if they improve cost allocation practices, even if these alternative approaches are no longer necessary for incentive purposes. Thus, regulators could continue to favour, for example, alternative mechanisms to permit the recovery of implementation costs over time, where such costs would not be allowed under normal accounting rules. Recovering implementation costs over the life of the contract may improve cost allocation patterns, even if no longer necessary to induce changes in utility behaviour.

6.3 The need for incentives

A general philosophical issue is whether utility regulators need to provide incentives for utility shareholders (and managers) to adopt particular technologies or solutions. One point of view is that incentives are not necessary to induce appropriate utility behaviour: if a particular technology or solution is the most cost-effective, then utilities should adopt that solution or technology as a matter of course. Any decision to adopt a less efficient or effective approach could be challenged on the basis of "prudence".

Counterpoints to this perspective are as follows:

- Strategies that involve both incentives and penalties may be more effective than strategies that rely only on penalties. In other words, regulators can use both "carrots" and "sticks". Mechanisms that incentivize the use of cloud solutions (or, more precisely, remove disincentives against their use) may induce better behaviour than simply relying on, for example, the potential use of a prudence review.
- Regulators may have difficulty gaining the information required to understand when cloud computing solutions are the most cost-effective. Cloud computing is a rapidly emerging field where best practice is evolving: even utilities themselves face a learning curve and may lag companies in other sectors where IT system are more of a core focus. In practice, regulators may thus not have the information to know when a particular IT solution is not the optimal solution and to undertake an effective prudence review. Incentives can thus help address the associated information asymmetry, by encouraging utilities to more actively consider the cloud computing option. We further note that overcoming informational asymmetries is often a primary rationale for utility incentives generally: the recognition that incentives can help remove barriers to the identification of the most cost-effective opportunities.
- There is ample precedent where regulators have built incentive mechanisms into rate-setting processes. For example:
  - Regulators' sometimes provide earnings bonuses to utilities for meeting performance targets. For example, the Illinois Commerce Commission has adjusted Commonwealth Edison's target ROE based on meeting performance metrics associated with system reliability (SAIDI and CAIDI), reductions in unaccounted for energy, and participation by minority and women-owned businesses in its supply chain.[39]

[39] State of Illinois, Public Act 097-0616, pp. 96-97.

– The so-called "RIIO" model in the United Kingdom incorporates a wide range of performance metrics when setting allowed revenues for utilities. (RIIO captures the idea of setting **R**evenue using **I**ncentives to deliver **I**nnovation and **O**utputs.) [40]

6.4 Incentives for capital expenses versus operating expenses

From a utility financial perspective, a major change associated with the introduction of cloud computing is typically the replacement of an initial upfront capital investment (in particular for computer hardware and software) with annual payments to a cloud service provider. For a utility, capital investments result in an increase in the utility's Rate Base and hence an increase in allowed earnings under a Cost of Service ("CoS") rate setting framework. Annual operating expenses, in contrast, are typically treated in most rate setting frameworks as a pass-through cost, resulting in no direct opportunity to increase shareholder earnings. Some commentators therefore believe that utilities have an incentive to favour solutions that involve capital investment, relative to solutions that involve increases in operating costs. Any such incentives for capital spending could inhibit utilities' adoption of cloud computing solutions. This reflects the fact that cloud solutions typically require less upfront capital investment but entail higher annual operating expenses than traditional in-house approaches to IT delivery. Theoretically, utilities might therefore continue with in-house solutions even when overall costs between a cloud solution and a traditional "in-house" approach are equivalent.

Utilities may also perceive more pressure from regulators to reduce operating costs than to reduce capital costs. This reflects the following considerations:

– Increases in annual operating expenses flow through directly into increases in required current revenues, whereas additional capital costs are recovered over time, which moderates the immediate impact of capital cost increases by pushing rate recovery into the future.

– Regulators typically find it easier to compare and benchmark operating costs across utilities than to compare capital costs and asset bases. The book value of assets can vary widely depending on asset age and installation date, making comparisons difficult even for utilities that have similar system configurations.

– Some incentive rate-making mechanisms focus primarily on operating expenses, in part because of the issues noted above.

Regulators' focus on operating costs could also dissuade utilities from moving to solutions that increase operating expenses relative to required capital investments.

6.5 The Totex model

Concerns over a capital bias under traditional regulatory regimes have underpinned many attempts at regulatory reform. We note, for example, that under the RIIO model in the UK, Ofgem — the government regulator for gas and electricity markets — has introduced the concept of "Totex". Under this model, actual operating and capital expenditures are grouped together, and a fixed percentage of these expenditures is capitalized, for later recovery through depreciation and a return on Rate Base.

[40] KPMG, "Literature Review of Alternative Approaches to Regulation", report for CAMPUT, December 2012, pp. 9-11

The Totex model was first applied to electricity distribution companies and involves transferring a fixed 85% of total expenditures into Regulatory Asset Value ("RAV"), independent of the exact breakdown of these expenses. The rationale for this model is to avoid incenting utilities to favour capital-based solutions over those solutions that entail an increase in operating costs. This treatment is applied independently of the capitalization policies used for financial reporting purposes, and hence, two sets of accounts need to be maintained.

The Totex model could theoretically be used as an incentive mechanism for cloud computing. We have not, however, specifically considered or examined this model as part of this study. This reflects the following:

– The Totex model entails a fundamental shift in rate-making practice and, as noted, was not introduced specifically to encourage cloud computing. If used, it would therefore likely be part of a more comprehensive overhaul of utility compensation practices generally.

– We have not seen evidence of the adoption of the Totex model in North America (although this model has been widely discussed in regulatory circles)[41].

– Because of the additional complexity involved, the Totex model may not be suitable for the Canadian market, where utilities are more numerous and often smaller than those in the UK (where there are a limited number of large regional utilities.) Hence, the additional accounting complexity would entail additional costs.

Discussion of the Totex model occurred in New York as part of deliberations in regard to Reforming the Energy Vision ("REV"). A white paper prepared by Staff at the New York Department of Public Service suggested that Totex may not be applicable for New York based on the following considerations: [42]

– Under US GAAP, utilities are permitted recovery of assets based on original cost less depreciation. (Presumably the implication is that asset value cannot be based on other measures.)

– UK distribution utilities do not perform the "platform provider functions" planned in the DSP model proposed for REV.

– Regulatory assets in New York account for over 24% of utility equity. Adoption of an alternative approach such as totex could expose utilities to a write-off of these regulatory assets, since a totex approach will hinder a utility's ability to demonstrate that specific recovery of these assets is being provided through rates.

In regard to the last point, the staff report noted that "deferrals are not permitted under the UK system, and an inability to book deferrals would inhibit approaches under REV that would require utilities to defer and earn a return on certain DER-related operating expenses. It could also increase earnings volatility and increase the cost of capital". [43]

[41] The Ontario Energy Board has started two consultations to address utility remuneration and responding to distributed energy resources to support the evolution of the sector" and the totex model is addressed by some stakeholders in their presentations and submission letters.
[42] New York Public Service Commission, Case 14-M-0101, "Staff White Paper on Ratemaking and Utility Business Models," July 28, 2015., p.43.
[43] New York Public Service Commission, Case 14-M-0101, "Staff White Paper on Ratemaking and Utility Business Models," July 28, 2015., p.43.

6.6 Other considerations

A number of the proposed mechanisms rely on the deferral of costs to consumers (through deferral of costs that would otherwise be expensed) in order to allow utility shareholders to earn a return. Consumers pay more in nominal dollar terms in total, but this is compensation to utilities for the delay in receipt of revenues. Evaluated at the utility's pre-tax cost of capital, the Net Present Value ("NPV") of revenues, and hence costs to consumers, is identical. From this perspective, and assuming that the cost of capital for consumers is identical to utilities' pre-tax cost of capital, an incentive that is based on capitalizing cloud computing costs does not in itself result in any additional cost to consumers (on an NPV basis) than the traditional treatment as an expense. If consumers cost of capital is higher, then they actually benefit from the deferral. Only if their cost of capital is lower do consumers face higher costs in NPV terms.

6.7 Options

In this section, we review the advantages and disadvantages of some specific regulatory options for incentivizing the use of cloud computing solutions. These options are as follows:

– Option 1 - Defer payments over remaining term
– Option 2 - Defer payments over fixed term
– Option 3 - Prepayment
– Option 4 - Treat as a capital ease
– Option 5 - Provide an earnings uplift
– Option 6 - Defer implementation costs

These options are discussed in more detail below.

6.7.1 Option 1 – Defer payments over remaining term

Under this option, annual payments to a cloud provider would be capitalized and amortized over the remaining length of the contract term.

Advantages

The advantages of this option are as follows:

– It allows utilities to earn a return on cloud payments, helping to offset lost earnings on traditional IT investments.
– Payments are still collected within the period of the cloud contract, ensuring that costs are matched with benefits on an overall basis.

Disadvantages

The disadvantages of this option are as follows:

– This approach results an uneven recovery of costs from consumers over the period of the cloud contract. As a result of the mechanics of this approach, the recovery of costs is shifted towards the end of the contract.

– It increases utility funding requirements somewhat, since cost recovery in the early part of the contract term is deferred.

– It requires more administrative effort, since accounting arrangements become more complex. (We note, however, that this is well within the administrative capability of most utilities, since they are used to capitalizing many assets and dealing with regulatory deferrals.)

6.7.2 Option 2 – Defer payments over fixed term

Under this option, each annual payment to a cloud provider would be deferred and amortized over a period equal to the initial length of the contract term.

Advantages

The advantages of this option are as follows:

– The advantage of this approach, relative to the prior option (to defer over the remaining term), is that it results in a more even recovery of costs over time. The increase in rates toward the end of the term is less significant because cost recovery is extended beyond the contract term.

Disadvantages

The disadvantages of this option are as follows:

– This approach runs counter to the general principle that costs should be matched to benefits. (Under this principle, the consumers that benefit from a service should be the ones that pay for it.) Under the approach of capitalizing each payment for a fixed period, consumers in the period beyond the contract term continue to pay for the contract, even though it is no longer providing service (and benefits) to the utility. It thus raises issues of inter-generational equity. This is difficult to justify under normal cost allocation principles for regulated utilities.

– Similar to Option 1 above, there is an increase in utility funding requirements and some minor administrative complexity (although both issues should be manageable).

6.7.3 Option 3 - Prepayment and deferral of cloud expenses

Under this option, utilities would be allowed to pre-pay for cloud computing services. Rather than pay an annual fee over the term of the contract, they would instead pre-pay for the services. The upfront payment amount would be deferred and costs recovered over the life of the contract.

For this approach to be cost-effective, utilities must receive a discount from the cloud provider for this prepayment. For our analysis, we have assumed that the discount would be based on utilities pre-tax cost of capital. This is likely a reasonable assumption for our initial financial analysis. Relative to other companies, utilities have a low cost of capital. Their status as rate-regulated entities providing a monopoly service allows them to use higher levels of debt and to raise debt and equity capital at lower cost, because of the perceived lower risk. Technology companies and IT service providers, in contrast, may theoretically have a higher cost of capital.[44]

[44] We note, however, that cloud service providers may, in practice, be reluctant to provide discounts to the extent needed to ensure cost equivalence. This could offset some of the potential benefits of this approach.

If no discount is received from the cloud provider, this approach will increase overall costs to consumers. The cloud provider will receive higher revenues in net present value terms, and this will translate into higher costs for consumers relative to the traditional cloud project.

Advantages

The advantages of this option are as follows:

– Relative to the prior options (to defer each annual payment over the remaining term or for a fixed period), this option results in a more even recovery of costs over time. Cost recovery is very similar to that for a traditional in-house project.

– There is Canadian regulatory precedent for treating certain costs this way, such as DSM costs in Quebec and British Columbia.

Disadvantages

The disadvantages of this option are as follows:

– If contract terms are not appropriately drafted to allow for service changes, prepayment could result in less flexibility for the utility, making it more difficult for the utility to make changes during the contract term because it has been prepaid.

– Prepayment may result in more credit risk for the utility, since it is more dependent on the continued solvency of the cloud provider. Credit assessments and/or performance bonds could help to mitigate this risk.

– In practice, prepayment may not be realistic for contracts with longer-term duration, particularly beyond 5 years.

– The Prepaid option negates the savings in upfront cash flows that would otherwise be associated with the Cloud solution (other than those that occur because the cloud solution is cheaper). Utility financing needs are thus higher than they otherwise would be.

6.7.4 Option 4 - Treat as a capital lease

Under this option, the utility is allowed to capitalize the present value of cloud computing contract at the beginning of the contract term. Unlike under the Pre-Paid option, however, the actual cash payment stream to the Contract provider remains the same. (Payments are made on a periodic basis and are therefore not prepaid.) This approach results in a cloud contract being treated in a similar manner for rate setting purposes as a lease, where leases are allowed in rate base. (It does not mean that the cloud contract would be considered to be a lease.)

Advantages

The advantages of this option are as follows:

– Similar to the Prepaid option, it results in a relatively even recovery of costs from consumers over time.

– Relative to the Prepaid option, this Option does not require that the utility shifts its cash expenditures forward. Payments to cloud providers remain as under the cloud option, meaning that there is no loss of flexibility (i.e., in changing the contract) or increase in financial risk (because of increased credit exposure).

– There is Canadian regulatory precedent for allowing utilities to include lease assets in the rate base and to earn an interest at the rate of return, such as Toronto Hydro in Ontario.

Disadvantages

The disadvantages of this option are as follows:

– There is some mismatch between utility costs and utility revenues. Revenues are greater than cash costs in early years, and lower in later years (once the Rate Base value has been depreciated). This effectively results in positive cash flows to utility shareholders in earlier years, which must then be "repaid" in later years. Our modeling suggest that, for utility shareholders to be kept "whole", the discounted value of lease payments used to set up the capital asset must use the post-tax cost of capital rather than the pre-tax cost of capital. This results in this option resulting in higher costs of consumers, measured on a net present value basis.

6.7.5 Option 5 - Provide an earnings uplift

Under this option, the utility is simply given an earnings incentive, in the form of a mark-up on cloud expenses, to incentivize shareholders to consider cloud solutions and to offset the lost shareholder earnings relative to options where costs can be capitalized and included in Rate Base.

As one potential scenario, regulators could consider implementing an earnings uplift for only a limited period of time, in order to encourage early exploration and adoption of this emerging technology (i.e. cloud). Once the technology becomes more established and accepted, the earnings uplift could be scaled back or phased out. This could help address stakeholders concerns that shareholders are being incentivized to do things they should ultimately be doing anyway. Providing an earnings uplift for only a limited time would also reduce concerns over "free-ridership". Based on our consultations with industry members, it is clear that cloud computing remains an emerging technology in the electricity sector. It is currently used for a number of smaller applications but still represents a relatively small share of IT delivery approaches.

Advantages

The provision of an adder on top of expenses to compensate utilities for their lost earnings opportunity has some conceptual advantages:

– It directly addresses the issue of concern, which is that utility's shareholders lose the benefits associated with putting their capital at work.

– It does not alter the general pattern for the recovery of costs from consumers. (It just shifts costs up slightly). This is generally positive from the perspective of good cost allocation practice.

– The adder could theoretically be adjusted for different circumstances: for example, a higher adder could be associated for cloud contracts that replace longer-lived assets. (Longer-term assets tend to produce higher shareholder benefits than shorter-lived assets given the longer period available to shareholders for earning a return).

– As a policy tool, it is visible and transparent.

– It does not require any changes to accounting rules, and therefore does not lead to differences between financial accounts used for rate-setting versus those used for financial reporting.

Disadvantages

The disadvantages of this option are as follows:

– It results in an additional, observable cost that is directly transferred to consumers. This is a "deadweight" cost.

– As with any incentive that is a fixed percentage of cost, it provides utilities with an incentive to increase the costs associated with the program in question. Greater oversight will be needed to ensure that reported costs are prudent.

– It may provide utilities with an incentive to categorize costs as cloud-related in order to gain the uplift. Some administrative effort may be required to police this.

6.7.6 Option 6 - Defer implementation costs

Under this option, the utility is allowed to defer implementation costs that would otherwise be expensed. Relative to some of the earlier options examined, this is a relatively limited adjustment to rate setting approaches. Annual payments to access the cloud would continue to be treated as a pass-through expense.

As noted earlier, different accounting standards (i.e., IFRS versus US GAAP) entail different rules as to which implementation costs can be expensed versus which can be capitalized. To the extent that some costs can be capitalized, no alternative rate treatment is required. (The regulator can simply follow financial accounting practice.) This specific option is intended to capture the scenario where a regulator allows costs to be capitalized for rate-setting purposes, where they would otherwise be expensed under accounting rules.

Advantages

The advantages of this option are as follows:

– Relative to other options, this option is a relatively small change to accounting practice. It may thus be easier for stakeholders and regulators to accept and implement.

– It arguably results in a better matching of costs to benefits, since implementation costs are recovered over the period of the cloud contract, rather than coming out of expenses in the starting year.

Disadvantages

The disadvantages of this option are as follows:

– As a relatively small adjustment, it only addresses part of the shareholder benefits lost with a move to cloud computing.

7 Financial analysis

This chapter summarizes the findings from our financial analysis of a number of alternative options for setting rates to recover cloud computing expenses.

In this chapter, we examine a number of alternative rate setting approaches that may enhance utilities incentive to examine cloud computing solutions. These are as follows:

– Option 1 - Defer annual cloud payments over the remaining life of the cloud contract.

– Option 2 - Defer each annual cloud payment over a period equal to the initial total life of the Cloud contract.

– Option 3 - Defer pre-paid cloud payments

– Option 4 - Add the present value of cloud payments to Rate Base at the beginning of the contract term, and amortize this value over the life of the cloud contract. This treatment has parallels with how financial accounting rules deal with capital leases: while payments continue to be made annually, the lease is treated as a capital asset that is amortized over the contract term for quantifying annual expenses.

– Option 5 - Add an uplift to annual cloud payments, which would be used to provide utility shareholders with an earnings incentive.

– Option 6 - Defer cloud implementation costs over the term of a cloud contract.

These alternative rate setting approaches have been proposed in a number of US jurisdictions. These alternative rate setting approaches are compared to two “base case” models:

– A model representing a traditional “in-house” project.

– A model representing a cloud computing project, where costs for rate setting purposes are defined as for financial reporting (or accounting purposes).

It should be noted that the alternative rate setting models proposed above result in a difference between accounting practices for general financial reporting (i.e. accounting) purposes and those adopted for rate setting purposes. This will result in some form of Regulatory Asset or Liability, reflecting timing differences in the recognition of expenses.

7.1 KPMG modeling tool

To support the analysis in this chapter, KPMG developed a flexible financial model in Excel spreadsheet form. This model allows the analysis of many different scenarios, although only a subset of potential scenarios could be analyzed for this report.

The model analyses the Revenue Requirement over time for a utility adopting a cloud computing project under the alternative rate setting approaches noted above. By showing the annual Revenue Requirement over the period of cost recovery, we can show the differential impact on consumers of differing rate setting approaches.

Under a Cost of Service model, it is important to identify parameters associated with the utility’s cost of capital, which depends on allowed returns for equity and debt, on the assumed capital structure, and on the corporate income tax rate. Our base case values for these parameters are summarized in the Exhibit 7-1 below.

Exhibit 7 -1 - Assumed Cost of Capital

Capital Structure Parameters					
	Share	**Deemed Cost**	**Pre-Tax Cost**	**Weighted Pre-Tax Cost**	**Weighted After Tax**
Debt	55.00%	5.00%	5.00%	2.75%	2.75%
Equity	45.00%	9.00%	12.33%	5.55%	4.05%
Total Allowed Return				**8.30%**	**6.80%**

The parameters shown are intended to be reasonably representative of those that would apply to an investor-owned utility in Canada. For a Crown-owned utility, as found in many provinces, the following differences are likely to apply:

– No income taxes may be payable, resulting in a cost of capital that is equivalent on a pre-tax and after tax basis.

– The proportion of debt in the capital structure may be higher, perhaps as high as 80%.

While these differences would change the specific figures modelled, they would not significantly influence the relative differences observed between the different rate setting approaches modelled.

7.1.1 Key assumptions

In order to streamline the financial model and to focus on the key differences between alternative rate setting approaches, we made a number of simplifying assumptions:

– For calculating Net Present Value, cash flows (capital expenditures, revenues, and expenses) are assumed to occur at the end of each year.

– Capital additions are added to the Rate Base at the end of the year that they occur.

– Allowed equity and debt returns are based on Rate Base values at the beginning of the year.

– Deemed income taxes for rate-setting purposes are calculated as an uplift on allowed equity returns in each period.

– Actual income taxes payable by utilities are equal to deemed income taxes estimated for rate-setting purposes. (Therefore we do not look at cash flow implications where actual taxes paid differ from deemed taxes).

– When cloud payments are capitalized, they are paid at the end of the prior year (or effectively at the beginning of the year rather than at the end). Pre-paid amounts are discounted by the average pre-tax cost of capital to ensure costs for ratepayers are equivalent. (As an alternative, an option exists in our model to discount at the post-tax cost of capital.)

– Projection covers a 20-year period only. (Cloud project life must thus be 10 years or less to properly model the scenario in which each annual cloud payment is amortized for a period equal to length of contract term.)

We recognize that this model differs in important respects from how rates are actually set in practice. Thus, in practice, we note that:

– Rate Base is typically calculated as the average of beginning and ending asset values.

– A half-year rule is typically adopted for the calculation of depreciation expense. Thus, an asset is charged for only one-half year of depreciation in the year that it goes into service. As a consequence, it also incurs only one-half year of depreciation in the last year of its accounting life.

We chose to ignore these specific elements of actual rate setting practice for the following reasons:

– Using average values for Rate Base makes it difficult to show in any model that the investors are able to earn their allowed rate of return in practice.

– Introduction of the half-year rule significantly increases modeling complexity and results in two stub-periods that have markedly different allowed revenues. This complicates the analysis of revenue patterns with no offsetting analytical benefit.

In summary, we believe our simplified model is a reasonable approach for evaluating the relative merits of alternative rate-setting treatments.

7.2 Shareholder earnings

It is easy to identify that moving to a cloud computing model, with expensing of all annual payments, results in a reduction in utility shareholder earnings. If operating expenses are treated as a pure pass-through, no equity return will be generated in the event that no capital investment is made.

As noted earlier, this potential reduction in equity earnings has been cited as a disincentive for utility shareholders to adopt a cloud computing model. It would be incorrect, however, to assume that the calculated loss in earnings is an appropriate measure of the loss to shareholders. Under any cloud computing project, shareholders benefit because they do not have to make the upfront capital investment associated with a traditional in-house project. They are thus free to deploy the associated funds for other purposes, perhaps in investments outside of the utility. To take this alternative into account, our model assumes that shareholder equity has an opportunity cost that is different than, and somewhat lower than, the return allowed by utility regulators. For our initial modeling work, we assumed that this equity opportunity cost is 7%, in comparison to our assumed return on equity for rate setting purposes of 9%.

The existence of a spread between allowed returns and opportunity cost is consistent with the fact that utilities often trade at a premium to book value. There is an argument that, in setting allowed returns, regulators need to provide some margin about equity's true opportunity cost in order to provide a buffer against errors in estimation of the cost of equity. This helps avoid the very serious damage to a utility's ability to raise capital, and hence the utility's financial stability, in the event that allowed returns fell below true underlying costs.

The idea that regulated utilities have a capital bias has often been termed the Averch-Johnson effect. We note that the seminal paper in which this effect was postulated assumes, consistent with the assumption above, that there is a differential between allowed returns and the cost of capital.[45]

[45] Averch, Harvey; Johnson, Leland, "Behavior of the Firm Under Regulatory Constraint", American Economic Review, 52 (5), 1962, pp. 1052-1069. .

In modeling a hypothetical project with a capital cost of $1,000 and a lifespan of five years, and with other assumptions as noted earlier, our model suggests that the incremental value to shareholders from making the investment is in the order of $20 to $25, on a Net Present Value basis.[46]

7.3 Base case analysis

For our initial comparison of options, we examined a scenario in which the cost of a cloud project was comparable in net present value terms to the costs of a traditional project undertaken in house. Cost equivalency allows us to focus on the underlying differences between these types of projects on how consumer rates will be impacted over time. Similarly, the impact of alternative rate treatments can be more readily discerned.

As discussed elsewhere, there is evidence that cloud projects can often be much more cost effective than in-house solutions. Cloud providers have access to economies of scale, based on serving multiple clients that are not available to a single utility. Cloud solutions also facilitate keeping solutions up to date. Thus, our model can also be used to evaluate conditions in which there is a cost-differential.

For our Base Case analysis, we assumed a very simple in-house project with a 5-year life and a capital cost of $1,000. The project has no annual operating costs. The cloud alternative that has an equivalent cost requires annual payments of $252.43 (at the end of each operating year). This payment amount has been selected because the cost profile has a similar NPV (of $1,000), where NPV is evaluated at the pre-tax allowed return for the utility (8.30%). In this initial scenario, there is no inflation.

Our initial assumption that an in-house project has no annual operating costs and that a cloud project has no upfront capital cost is clearly very simplistic. (In-house projects typically have some operating costs and cloud projects typically have some upfront cost.) Our simplistic assumption, however, allows us to focus on the key difference between the two delivery models: Cloud replaces an in-house capital investment with ongoing operating expenses and this is the key potential source of utility disincentives. Thus, our hypothetical, stylized example allows us to focus on the extent of the disincentive.

Assumptions are summarized for ease of reference in Exhibit 7-2 below.

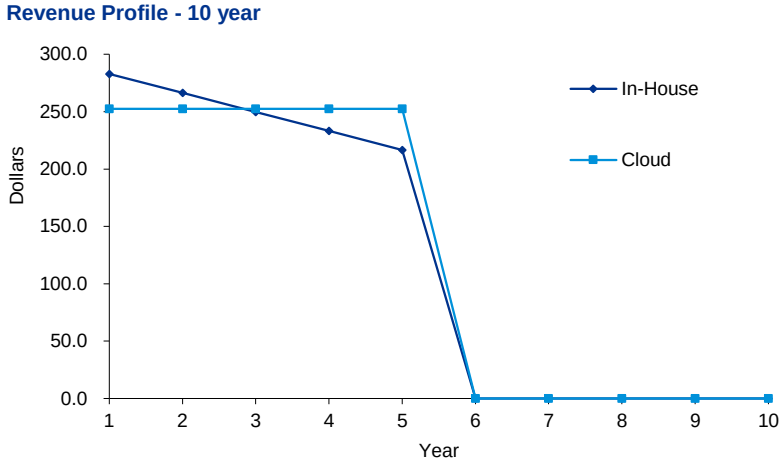
Exhibit 7-2 – Base Case Assumptions

Project Parameters - Base Case			
		In-House	**Cloud**
Lifespan	(Years)	5.0	5.0
Capital Cost	($)	1,000.00	-
Annual Operating Expense	($)	-	252.43
NPV of Costs to Consumers	($)	1,000.00	1,000.00

[46] The key assumptions driving this value is the differential between a 7% assumed opportunity cost of equity and an allowed equity return of 9%.

Exhibit 7-3 below shows rates paid by consumers under the two alternative delivery approaches. For the in-house project, costs paid by consumers decline over time. While the amount of a depreciation expense recovered annual remains constant at $200, the return on capital declines over time with the decrease in Rate Base (or utility Net Book Value). Under the cloud solution, revenues are flat, and simply reflect the recovery of an annual payment amount.

Exhibit 7-3 = Revenue Profile - In-House versus Cloud



As a next step, we then consider the impact of several of the alternative rate-setting approaches for the Cloud computing project. These approaches are:

- **Option 1 - Amortize Payments Over Remaining Term.** Defer annual cloud payments over the remaining life of the Cloud contract.
- **Option 2 - Amortize Payments Over a Fixed Term.** Defer each annual cloud payment over a period equal to the initial total life of the Cloud contract.
- **Option 3 - Defer Prepaid Cloud Payments.** Under this option, utilities would be allowed to pre-pay the payments due under a cloud contract, and could then amortize these prepayments in a similar manner as any other capital asset.
- **Option 4 - Capital Lease Treatment.** Add the present value of cloud payments to Rate Base at the beginning of the contract term, and amortize this value over the life of the cloud contract. This treatment has parallels with how financial accounting rules deal with capital leases: while payments continue to be made annually, the lease is treated as a capital asset that is amortized over the contract term for quantifying annual expenses.
- **Option 5 – Add an Uplift to Cloud Payments.** An uplift would be added to cloud payments to fund a shareholder earnings incentive.
- **Option 6 –Defer implementation costs.** In this option, only implementation costs would be deferred.

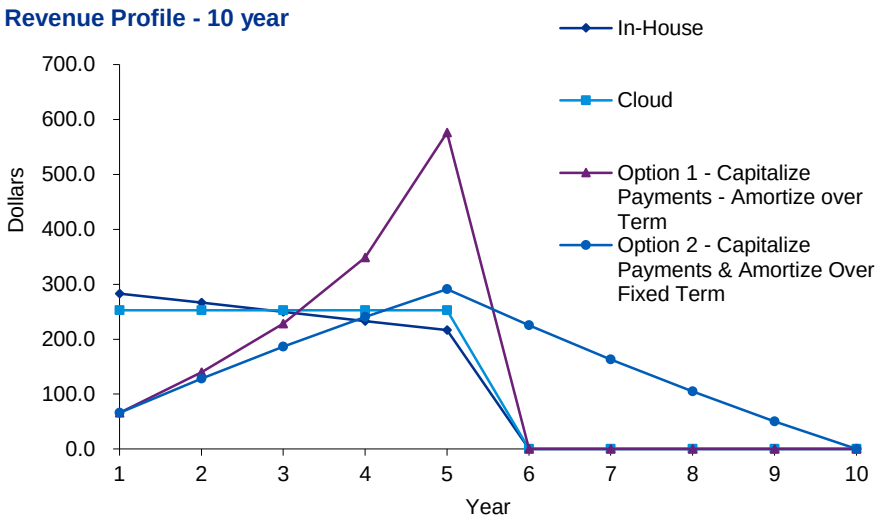
The specific modelling assumptions, and the modelling results, are discussed in more detail in the sub-sections below.

7.3.1 Options 1 and 2

In modeling Options 1 and 2, we made a slight adjustment to the cloud payment profile to avoid undue back-loading of the payment profile. Cloud payments were assumed to be made at the beginning rather than at the end of each operating year. To preserve the cost equivalence of these scenarios in net present value terms, we discounted such payments by the utility pre-tax cost of capital. Annual payments are therefore $233.09 rather than $252.43. Thus, the cloud provider is assumed to accept less revenue in return for getting paid at the beginning rather than end of each period.

Exhibit 7 – 4 illustrates the results of adding these two alternative scenarios.

Exhibit 7 – 4 – Capitalize Annual Cloud Payments



It can be seen that Options 1 and 2 result in very different revenue profiles. Option 1 results in an increase in revenues over the term of the contract, with revenues peaking at $576 in year 5. Option 2 results in a more gradual increase, with a peak of 291 in year 5. Under Option 2, revenues than fall again, with revenues of $50 in year 9 before falling to zero in year 10.

Both Option 1 and Option 2 entail differences in the revenue profile:

– Option 1 tends to push cost recovery to the later years of the cloud contract, resulting in an uneven and back-end loaded revenue profile.

– Option 2 entails a less dramatic increase in rates over time, but pushes cost recovery to behind the term of the cloud. Revenues are therefore arguably not well matched to rate-payer benefits. This raises some questions of ratepayer inter-generational equity.

7.3.2 Option 3 – Allow prepayment and deferral of cloud expenses

As noted earlier, Option 3 allows a utility to pre-pay a cloud supplier for cloud computing services. Deferral of these prepaid expenses would convert the asset into a revenue stream identical to that for an in-house project of equivalent cost (where equivalency is evaluated on an NPV basis using a discount rate equal to the utility's pre-tax cost of capital).

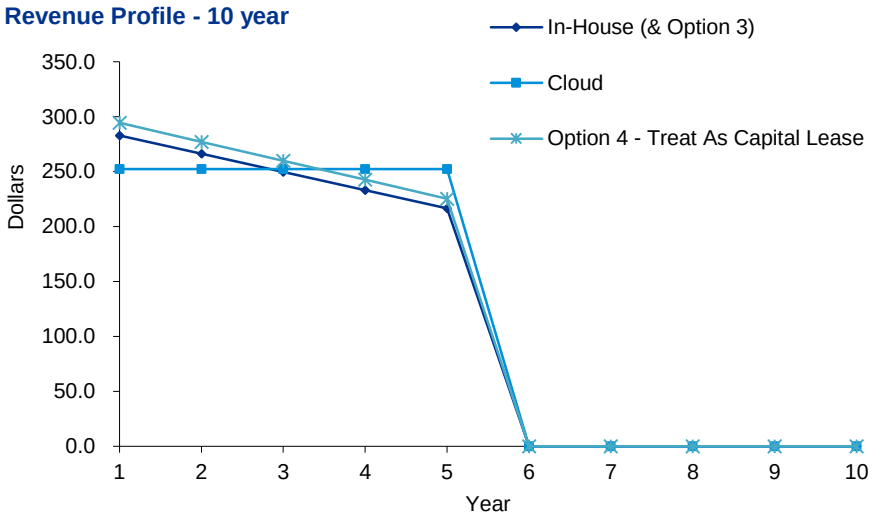
We note that, as input assumptions for our Base Case modeling work, we set Cloud payments so that they were equal to the capital cost of an in-house project on an NPV basis. Given these assumptions, Option 3 has a revenue profile that is equal to an In-House project, and shareholders benefit from an equivalent margin over their opportunity cost of capital. Hence, we have not specifically shown this option in a separate graph. Revenue impacts can be observed by looking at the profile for the in-house project.

7.3.3 Option 4 – Treat as a capital lease

Under this option, utilities would be allowed to add the present value of cloud payments to Rate Base at the beginning of the contract term, and amortize this value over the life of the Cloud contract. This treatment has parallels with how financial accounting rules deal with capital leases: while payments continue to be made annually, the lease is treated as a capital asset that is amortized over the contract term for the purpose of quantifying annual expenses for rate setting purposes.

Our modeling work suggests that, in setting the book value of the capital lease, the cloud payments should be discounted at the post-tax cost of capital rather than the pre-tax cost of capital, if shareholders are to earn their target rate of return on cash flow differences. Under the assumptions that we used for our Base Case analysis, this means a discount rate of 6.80% rather than 8.30%. At the lower discount rate and for our Base Case scenario, the capitalized value is therefore $1,040.60 rather than $1,000.00. The Revenue Requirement is correspondingly higher, as shown in Exhibit 7-5 below.

Exhibit 7 - 5 - Capital Lease Scenario



Under this Capital Lease scenario, the cash flow profile for utility shareholders is the reverse of that for a typical project: shareholders receive positive net cash flows in the earlier years, as the revenue from depreciation and from the regulated return on the book value of the lease exceeds the cash outflows from making cloud payments. This position reverses in later years. In effect, utility shareholders then "repay" these initial cash inflows.

7.3.4 Loss of shareholder benefits

As discussed earlier, utility shareholders lose the ability to earn in excess of their opportunity cost of capital when they forego making investments in the utility Rate Base. For our various project and rate setting alternatives, we have quantified the differences in this shareholder benefit. For any scenario, the benefit to equity holders has been quantified as the NPV of incremental shareholder earnings (above the equity opportunity cost), discounted at the post-tax equity opportunity cost (assumed to be 7%). We will refer to this as "shareholder value creation" or "shareholder benefits".

For our hypothetical in-house and cloud projects, the shareholder value creation is summarized in Exhibit 7-6 below. Shareholder value creation is also quantified for the proposed alternative rate setting options for a cloud project. As discussed, the in-house project has an assumed capital cost of $1,000. The equivalent Cloud project has annual costs with the same NPV. The Exhibit shows shareholder benefits for two time horizons:

– A project life of 5-years. (This project life underlies the modelling above).

– A project life of 10-years. This set of scenarios is added to show the implications for shareholder benefits from cloud projects with a longer life-span.

Exhibit 7 – 6 – Shareholder Value

Shareholder Value Creation ($)		
	5-Year Life	**10-Year Life**
In-House	23.1	38.3
Cloud	0.0	0.0
Option 1 - Amortize Over Remaining Term	16.8	27.3
Option 2 - Amortize Over Fixed Term	23.7	40.1
Option 3 - Prepayment	23.1	38.3
Option 4 - Treat As Capital Lease	24.1	41.0

As shown in the Exhibit, the shareholder benefit of an in-house project is relatively small, at just over 2.3% of the capital cost for the 5-year project. There is no shareholder benefit, as expected, for a traditional Cloud project given that associated expenses are treated as a cost pass-through.

For the alternative rate treatments considered, and for the five-year project life, the impacts are as follows:

– Amortizing costs over the remaining term (Option 1) results in a shareholder benefit of $16.80, which is almost three-quarters of the benefit noted for the In-House project. The benefit is less because the effective term of shareholder's investment is less: this reflects the delay in additions to Rate Base and the relatively short period for recovery of costs associated with cloud payments in later years.

– Option 2 results in even more shareholder benefit, with a shareholder benefit of $23.7 versus $23.1 for an In-House project. Shareholders have the opportunity under this option of making an investment with, effectively, a longer recovery period than the in-house project.

– Option 3, Prepayment, restores all of the shareholder benefit. From a utility cash-flow perspective, this option has an identical cash-flow stream as the in-house project. This reflects the fact that the prepayment amount has the same value as the in-house capital cost.

– Option 4 has a slightly higher shareholder benefit than the In-House project, measured as the NPV of shareholder cash flows.

Looking at the values for a 10-year project, we can see that shareholder benefits are higher, although the relationships among the various options are similar.

In regard to the capital lease scenario, we note that the shareholder benefit is higher than for the in-house project (at $24.1 versus $23.1). As discussed earlier, this was based on assuming a capital lease value of $1,070.00, calculated by discounting projected cloud payments at the after-tax cost of capital (of 6.80%). Interestingly, if we discount lease payments at the pre-tax cost of capital of 8.30% (and obtain a capitalized lease value of $1,000), the shareholder benefit under Option 4 is instead $23.1. This value is identical to the value for the in-house project. This may suggest that the 8.30% rate is the appropriate discount rate for calculating the Rate Base value of a capital lease. Under this alternative approach, however, the Internal Rate of Return ("IRR") for shareholder cash flows is 59.4%, or substantially in excess of the target 6.8%. The higher rate may appear to be an advantage for shareholders. It is, in fact, a negative. Because net cash flows are initially positive but then turn negative, the high IRR indicates that positive cash flows in early years are being repaid at, effectively, a very high rate of interest.

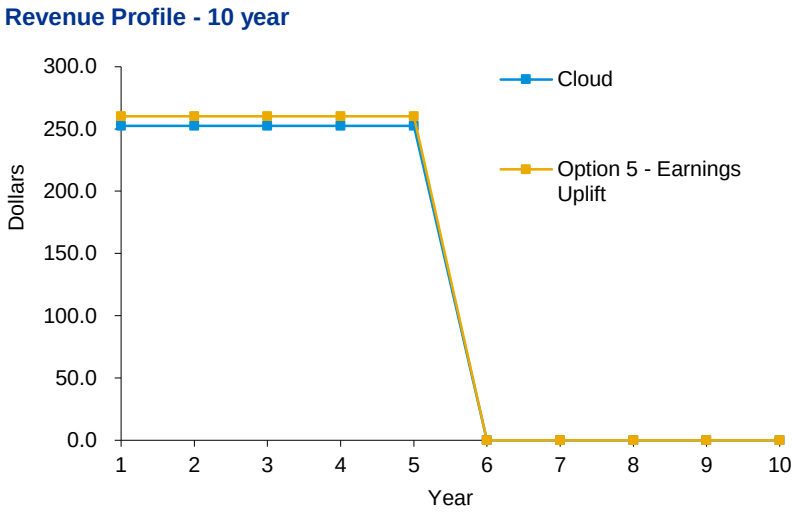
7.3.5 Option 5 – Increase cloud payments by an incentive adder

This option provides for the addition of an explicit earnings incentive for utilities to implement cloud computing projects. This incentive would be in the form of an earnings uplift, expressed as a proportion of eligible annual expenses. Working with our model, we found that, for our Base Case 5-year cloud project, an uplift of about 2.2% on annual cloud payments is required to provide shareholders with a similar earnings benefit as the equivalent in-house project. For the 10-year cloud project, the uplift required is about 3.5%. A higher uplift is required for longer-lived projects because the effective duration of the foregone investment in Rate Base is longer.

As before, the shareholder benefit is calculated as the NPV` of equity earnings, less the opportunity cost of capital deployed. Income streams are discounted at the opportunity cost of equity. (We note that, for the incentive adder option, there is no actual capital deployed, so that no opportunity cost of capital needs to be deducted in the calculation of shareholder benefit). In our model, the uplift noted (or 2.2% or 3.5%) is the additional shareholder earnings on an after-tax basis. Required revenues are actually 3.01% and 4.80% higher, taking into account the need to pay taxes on the revenue uplift.

Exhibit 7-7 illustrates the revenue impact. Revenues are adjusted up slightly, but retain the same flat profile as the underlying cloud payments. Hence, there is no change in the profile of cost recovery.

Exhibit 7 - 7 - Earnings Uplift



7.3.6 Summary conclusions

The analysis in the sections above is based on assuming that the cloud project has costs that are equivalent to those of an In-House project on a NPV (or discounted) basis. This is a reasonable starting point for evaluating the implications of alternative rate setting approaches for a cloud project.

As discussed elsewhere in this report, there are good reasons to believe that cloud projects can deliver significant cost savings. Supporting factors include the potential for economies of scale by cloud providers and the greater flexibility that the cloud provides for scaling computing capacities to

meet current utility needs and updating software functionality as required. To the extent that cloud solutions are, in fact, cheaper, there are the following implications for our rate analysis:

– Rates to consumers for cloud and for the associated alternative rate setting options will decrease relative to the rate profile for an In-House project.

– Shareholder benefits from alternative rate options may also decline as a result of the decrease in cloud costs. Thus, economic disincentives for utility managers and shareholders may increase.

7.4 Cloud project

In this section, we examine the implications of alternative rate treatments for a more representative cloud project. This project includes implementation costs. It therefore allows us to analyze the implications of deferring only implementation costs, and not annual payments. (This variant has been labelled as Option 6 in our analysis.)

For this more realistic project, we have assumed that the Cloud alternative incorporates the following assumptions:

– $500 in implementation costs that would otherwise need to be expensed in the absence of an alternative rate treatment.

– Annual payments of $238.53 (in base year dollars), escalated at an inflation rate of 2.0% annually.

– A five-year contract life.

These assumptions result in an overall NPV of costs of $1,500. One-third of the NPV of costs are thus assumed to be implementation costs; these are assumed to be expensed under traditional accounting and rate-making approaches. (For comparison purposes, we also assume that one-third of the costs of an equivalent in-house project would also be expensed.) Revenue profiles under the options are shown in Exhibit 7-8 below. For this chart we have focused on Options 1, 2, 4 and 6, since these cover the major differences in profiles among the options.

Exhibit 7 – 8 – Revenue Profile of Alternative Options

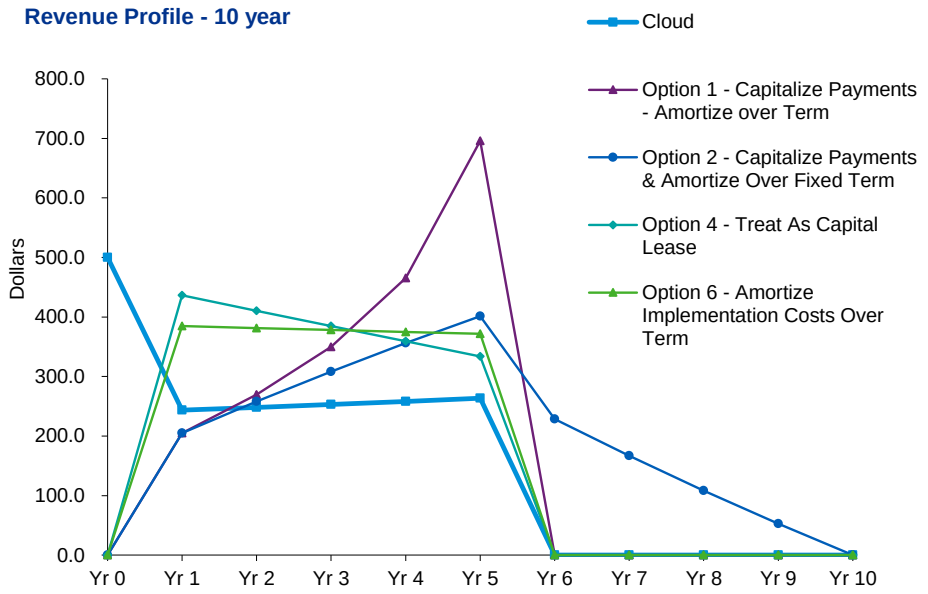


Exhibit 7 - 8 includes Year Zero, since this includes cloud implementation costs that may need to be expensed absent alternative rate making treatment. For the alternative options, we assume that these implementation costs are amortized evenly over the contract term. Observations are as follows:

– The heavier, medium blue line represents the cloud project as traditionally accounted for. Initial implementation costs are expensed (in Year 0), resulting in a spike in expenses. Annual cloud payments then follow.

– Option 6, which incorporates the smallest adjustment to rate-making practice, simply entails the capitalization of initial implementation costs and then recovers these costs over the term of the cloud contract. This is shown by the light green line.

– Options 1 and 2 capitalize annual cloud payments in addition, shifting costs to later years.

– Option 4, which converts all costs to the deemed value of a capital lease, has a similar profile of revenues as Option 6, although it is slightly more front-end loaded.

The NPVs of all revenue streams other than Option 4 are the same. The NPV of the revenue stream for a capital lease (Option 4) is slightly higher because of the use of a post-tax discount rate to set up the lease value, as discussed earlier.

The shareholder value creation differs for different revenue options. The extent of cost deferral differs across options, and deferral creates an opportunity for shareholders to earn a regulated return that is slightly higher than the opportunity cost of this equity. The value creation for different options is summarized in Exhibit 7 - 9 below. For completeness, this exhibit shows value creation for all scenarios.

Exhibit 7 – 9 – Shareholder Impacts

Shareholder Value Creation	
	($)
In-House	23.1
In-House - Capitalized Implemention	34.7
Cloud	0.0
Option 1 - Capitalize Payments - Amortize over Term	28.2
Option 2 - Capitalize Payments & Amortize Over Fixed Term	35.2
Option 3 - Prepayment	34.7
Option 4 - Treat As Capital Lease	35.7
Option 5 - Earnings Uplift (2% rate)	32.3
Option 6 - Amortize Implementation Costs Over Term	11.6

Observations with respect to this Exhibit are as follows:

– Allowing the capitalization of implementation costs is the first potential step that might be considered by regulators. For our hypothetical project, with implementation costs that account for one-third of total costs, allowing the capitalization of costs is associated with $11.6 of shareholder benefit. This is the value observed for Option 6, and also the difference between in-house scenarios with implementation costs that are capitalized versus expensed. (The first and second lines in the Exhibit.)

– For all other Options examined, capitalization of these implementation costs is combined with the alternative rate treatment proposed.

7.5 Summary observations of the financial analysis

The different rate making approaches analyzed have quite different impacts on the allocation of costs to consumers over time, on utility funding requirements, and on the profile of cost recovery. Accordingly, the best option in any given circumstance may depend on the specific factors at play. Relevant considerations may include the size of the project relative to overall capital budgets, the degree of incentive required, and the accuracy of cost estimates available. For example, degree of concern associated with any misallocation of costs may depend on the relative size of the project, and to the extent that the presence of many similar projects may smooth out anomalies in the pattern of cost recovery. We also note that for any specific cloud project, it may be difficult to estimate the relevant parameters of the displaced in-house project. Thus, the extent of lost shareholders earnings may not be clear.

The analysis in this Chapter is indicative of the relative differences between alternative approaches. However, in any given instance, the analysis should be updated to reflect the actual circumstances of a particular cloud project.

Based on our analysis and the specific assumptions used, it is clear that the alternative options do have considerable potential to offset the earnings that shareholders forego when moving away from traditional in-house projects. Accordingly, they can be a valuable tool for regulators that want to encourage the move to alternative computing arrangements.

8 Applicability to other sectors and applications

In this Chapter we review the potential application of the alternative ratemaking methodologies to expenses other than those related to cloud computing.

8.1 Other expense categories

This report has focused on the application of alternative rate-making methodologies to the implementation of cloud computing. The rate-making options discussed herein could also be applied to other utility expense categories, including to:

– Payments to third-parties for Non-Wires Alternatives (NWA).

– Demand Side Management ("DSM") programs.

In these types of programs, payments may be made to third-parties to reduce demand or energy growth or to provide capacity during peak demand periods. These types of programs can help utilities reduce capital expenditures and may be much more cost effective than increasing capacity to meet demand peaks that may occur in only a few hours. Similar to cloud computing arrangements, they may replace capital investments with an increase in operating expenditures.

Given the similarities in circumstances noted above, we believe that the alternative rate options examined herein are equally applicable to Non-Wires and DSM expenditures. In this regard, we note that the concept of an earnings uplift was applied in New York in the context of DER to offset the need for capacity additions to the local distribution system. Similarly, DER projects were the basis for such uplifts in California.

NWA projects, and many DSM programs, may displace assets that have a longer lifespan than those displaced by cloud commuting projects. IT assets are often amortized over periods of 5 years or less, whereas NWA and DSM programs are more likely to displace traditional investments in "poles and wires". These traditional utility asset classes may be amortized over periods that range from 20 to 40 years or more. Accordingly, the loss of shareholder earnings may be more significant for NWA and DSM programs than it is for cloud projects. This suggest that these alternative rate treatments are at least as applicable for these types of programs as they are for cloud projects. It may also mean that adjustments will be required in how these rate options are implemented for NWA and DSM projects. For example, the percentage uplift for a shareholder incentive mechanism may need to be higher for NWA projects.

8.2 Natural gas sector

The methodologies examined in this report are equally applicable to the natural gas sector and natural gas utilities. Natural gas utilities face computing requirements that are similar to those of electricity utilities, particularly with respect to:

– Customer Information Systems ("CIS"), including meter data management and billing.

– Work-force management.

– Asset management.

– Enterprise Resource Planning (ERP) systems.

As noted in our interviews with utility managers, many new and emerging applications are available only on the cloud.

Natural gas utilities may face slightly less IT cost pressure than do electricity utilities, taking into account the following factors:

– Natural gas utilities typically use less granular usage data for billing or for demand measurement than do electricity utilities, which increasingly bill for commodity usage on an hourly basis.

– The concept of a “smart grid”, with automated system operation and communication with on-premises appliances, is more focused on the electricity sector than the natural gas sector.

– Natural gas customers typically have fewer direct customers in any given jurisdiction.

Notwithstanding the points above, natural gas utilities can benefit from cloud computing and, with similar rate-setting regimes, face similar shareholder incentives to invest in capital assets. Accordingly, alternative rate setting mechanisms can help incent cloud computing options.

A Appendix A: Cloud opportunities and challenges

Over the past five years the major cloud vendors have significantly matured their cloud service offerings. According to Gartner, worldwide public cloud revenues were $227.8 billion in 2019 and are estimated to grow by 17% to $266.4 billion in 2020. Gartner estimates that, in 2020, sixty percent of organizations will use at least one external provider's cloud service offering, which doubles the percentage from 2018.[47]

Cloud as a technology direction has become the de facto standard. It may no longer makes sense for some organizations, private or public, to invest in on-premise infrastructure and services that are also available in cloud. Organizations are collapsing their data centres and selling them off or shutting them down. Furthermore, an existing trend in the software solutions space is that some software providers are shifting their portfolio of offerings to cloud-first or cloud-only solutions. Organizations will increasingly need to remain aware of the potential impacts to their business if key software (such as an ERP solution) is suddenly no longer supported by the provider. For example, organizations will need to consider future-proofing their technology operations, such as by gradually transitioning to the cloud instead of being forced to move to it if/when a key enabling software solution is no longer supported outside of the cloud.

However, the journey to cloud can be complex, challenging and time consuming. Cloud adoption across public and private organizations has been extremely varied. Some organizations have moved quickly to cloud. Many others have been slow to move. Fortunately, studies have been completed to understand this journey from various perspectives.

A.1 Key trends

The 2019 Harvey Nash / KPMG CIO Survey[48] (now in its 21st year) includes feedback collected from 3,645 respondents in 108 countries. A Canadian version of the report contrasts Canadian responses with the rest of the world. While this year's Canadian results indicate a continued focus on IT performance, there are hints of major changes affecting how executives view the role of technology contributing to their business goals.

As cited in the Harvey Nash / KPMG CIO Survey, these are some key trends:

Canadian CIOs responded that the following are significant topics of focus:

— Cyber Security (75%)

— Delivering consistent and stable IT (70%)

— Increasing operational efficiencies through technology (68%)

Regarding cloud use and customer data, Canadian CIO's reported:

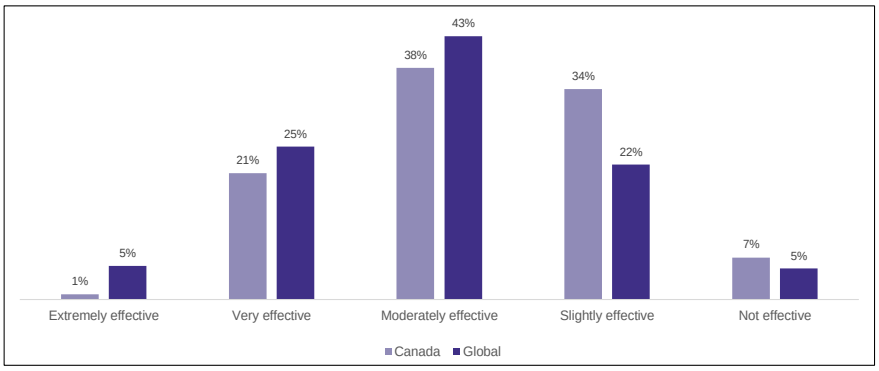
— Increased level of confidence in using cloud technologies (87%)

[47] Gartner, "Gartner Forecasts Worldwide Public Cloud Revenue to Grow 17% in 2020," press release, November 13, 2019, available at: https://www.gartner.com/en/newsroom/press-releases/2019-11-13-gartner-forecasts-worldwide-public-cloud-revenue-to-grow-17-percent-in-2020

[48] KPMG, Harvey Nash / KPMG CIO Survey 2019: A Changing Perspective ," June 12, 2019, available at: https://home.kpmg/xx/en/home/insights/2019/06/harvey-nash-kpmg-cio-survey-2019.html

— Customer data management will become just as important and product/service quality (92%)

> "60% of Canadian CIO's (73% globally) believe their company has been moderately, very, or extremely effective at using digital technologies to advance their business strategy."



Source: 2019 Harvey Nash / KPMG CIO Survey - https://home.kpmg/xx/en/home/insights/2019/06/harvey-nash-kpmg-cio-survey-2019.html

While digital technologies include a raft of technologies other than cloud, it is clear that digital adoption is progressing slowly in many organizations. Part of this can be attributed to the inflexibility of existing technical ecosystems. Modernizing this outdated ecosystem could require significant capital expenditure to overhaul the back-end infrastructure – a necessary step to support a more digital ecosystem for both clients and internal stakeholders. The most common method used to enable and support digital ecosystems in the current technical landscape is a shift to the cloud.

Approximately one-third of Canadian CIOs anticipate either major changes or radical transformations to their organization's business activity over the next three years. Typically, this requires a transformation to the technical landscape of the organization as well. In many cases, this type of organizational transformation requires significant time and resource investment and thus requires some level of operational/executive board approval. Given that 70% of Canadian CIOs are a member of the operational board or executive management team (v. 58% of Global CIOs), this bodes well for the CIO's ability to influence strategic change across their organizations, especially in Canada.

A.2 Challenges

The journey to the cloud is by no means a simple transformation. It requires significant planning, analysis, designing and testing prior to initiating pilot phases, optimization, and full-fledged rollouts. One of the challenges that CIOs face when embracing cloud services is that cloud is often compared to a utility, suggesting that organizations can procure computing capabilities just like electricity or water, and only pay for what they use. Except in the case of most SaaS solutions, this grossly over-simplifies the current state of cloud computing, especially for large, global enterprises. For example, electricity consumers typically do not have to choose between different types of power (e.g. nuclear, coal, solar), electricity suppliers, where their electricity is generated (e.g. on their premises or remotely at the utility company), or whether they are going to use AC or DC current. Furthermore, they do not have to create a new interface every time they want to plug something in.

Choosing cloud services means having to make decisions about service models (IaaS vs. PaaS vs. SaaS), delivery models (public vs. private vs. hybrid), location (on premise, off-premise dedicated, off-premise co-located) and then navigating an ecosystem with hundreds of vendors supplying the components that must be stitched together to provision a workable solution. Then companies need

to consider what will happen to their existing IT infrastructure and its data centers and legacy applications. These often represent a significant capital investment, which may be reflected on the organization's balance sheet. Additionally, as will be elaborated further in this document, there are accounting considerations that need to be thoroughly evaluated and addressed prior to making a final decision on the use of cloud services.

It is evident that even with all the potential benefits of cloud, organizations encounter many barriers when adopting cloud, ranging from compatibility and integration issues with existing systems to legal and regulatory compliance.

Below we have included a high-level graphic showing some of the key challenges in cloud adoption:

1. **Suitability for cloud:** The fact is that many legacy systems have architectural limitations, are tightly coupled to their infrastructure, or have other constraints that prevent them from being easily migrated to the cloud. They will either need to be replaced or re-written at significant time and cost.
2. **Data loss and privacy risks:** Using public cloud means putting data outside of the firewall and in a location that is not always obvious. Concerns arise over the ability of cloud providers to protect the data and keep such data segregated from other co-located companies.
3. **Legal and regulatory compliance:** Different countries and different industries have varying approaches, which has an impact on where cloud computing resources are located, where data are stored, how it is transmitted, who has access to it, and who controls it. The large cloud providers are investing significantly to build out their geographic footprints to be able to meet these diverse requirements.
4. **Cloud governance:** Decision rights about when, where, and how to use cloud need to be identified and enforced. The availability of SaaS solutions has enabled business users to directly procure technology solutions without involving IT departments. This can be a benefit but it can also create serious risks and other problems if not controlled. It is challenging to strike a balance that ensures that the enterprise is protected without putting up barriers that slow decision-making and that prevent the business from seizing valuable opportunities.
5. **Making the business case/ROI:** Over the years, organizations have made considerable investments in data centers, filling them with servers, storage, and networking equipment to support their applications and services. These investments often represent a large asset on their balance sheet. Moving these workloads to the cloud may require one-off migration costs and a write-off of the remaining IT assets' net book value. This could eliminate any cost benefits and thus invalidate the cloud business case.