

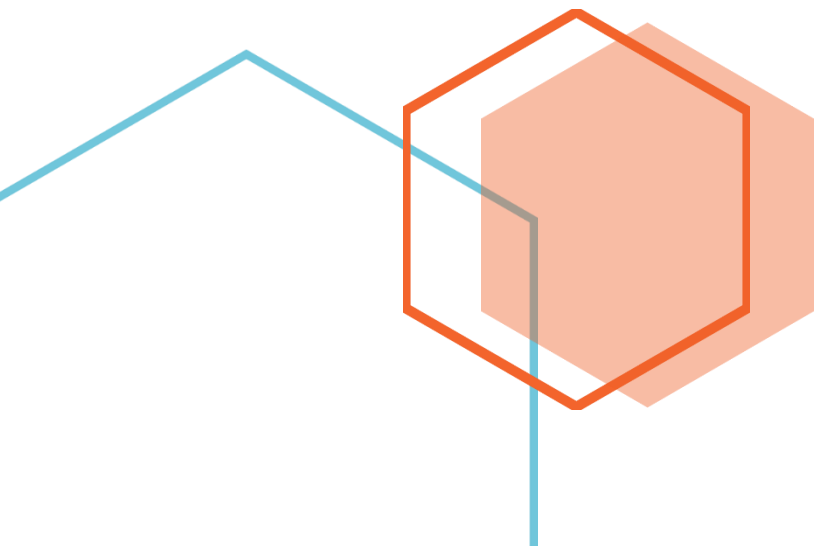


Advisory Committee on Innovation

Report to the Chair of the Ontario Energy Board

Actions the OEB can take to advance innovation in Ontario's energy sector

November, 2018





Introduction

Consumer choices for energy services are changing, not just here in Ontario but around the world. Whether driven primarily by policy choice, advanced technology, customer expectations or emerging business models, the traditional means of supplying, delivering and using energy is in the midst of an important transition.

Emerging distributed technologies are providing customers with an increased ability to determine how their energy is provided and how they use it. Flexible demand, small distributed generation, fuel switching, energy storage, software solutions, advanced power electronics, and increasingly economic information and communication technologies are also providing utilities with new means to serve their customers.

Options for responding to growth in demand and maintaining reliable service, for example, now extend beyond the largely capital-intensive infrastructure development that has been the hallmark of energy service provision for decades. Today's energy consumers have a range of options to meet their reliability or adequacy needs, including a combination of the distribution utility, the customer's own assets and third party service providers. If the regulation of utility planning and investment decisions is not updated to consider and accommodate these new customer options when it makes sense to do so, utility customers may miss out on opportunities for better and more efficient service.

No one can say exactly how fast or to what extent transition will take place or what the eventual market structure will look like and it would be a mistake to try to predict a specific outcome. But few deny that change is happening and that distributors, whose role may be to adopt innovation as well as to provide the platform to enable others to do so, will be among those most affected.

Broad Actions to Support Innovation



The following broad actions should help to support innovation in energy services:

- Provide a transparent and level playing field by clarifying expectations and requirements regarding obligations between parties and towards customers
- Remove disincentives to innovative solutions by changing how utilities are remunerated, and introducing more systematic methods of valuation and pricing
- Encourage market-based solutions and customer choice by making more detailed and timely information available to sector participants
- Embrace simplified regulation by adopting simple and timely ways to allow for experimentation



While distributed energy resources (DER) and fuel switching are a relatively new influence in the energy sector here and abroad, they are not the only form of innovation. Innovation is much broader; it is implementing something fresh – either new or improved – to create value. Innovation can be transformative and effect fundamental change in a sector – in business models and in energy services. Innovation can also be incremental and achieve efficiency gains and cost savings for a utility or a customer. Innovation in regulation can spur transformative and incremental innovation in the sectors it regulates. Regulators, utilities and their customers engage in both types of innovation.

This Advisory Committee on Innovation was asked by the Chair of the Ontario Energy Board (OEB) to identify actions the regulator could take to create an environment to support innovation that brings value to customers.¹

The Committee notes that the regulatory framework currently in place is not broken. However, it is not clear how well it will serve the future. Furthermore, it is unclear that existing policies that support innovation are being used in an optimal fashion, such as cost recovery for conservation activities that defer capital, or the availability of project-specific incentives. Finally, it is also unclear whether the current regulatory framework will enable customers to fully realize emerging opportunities to benefit

from better and more efficient services made possible by evolving technology and business models.

The following broad actions should help to support innovation in energy services:

- **Provide a transparent and level playing field** by clarifying expectations and requirements regarding obligations between parties and towards customers
- **Remove disincentives to innovative solutions** by changing how utilities are remunerated, and introducing more systematic methods of valuation and pricing
- **Encourage market-based solutions and customer choice** by making more detailed and timely information available to sector participants
- **Embrace simplified regulation** by adopting simple and timely ways to allow for experimentation

The Committee discussed a broad range of issues, including some it understands the OEB does not have direct influence over. Two issues in particular the Committee discussed are critical to successful sector transformation – how people can adapt to change and how capital markets may respond to change. The former has to do with workforce development and business transformation – a key cultural issue considered globally to be an important

¹ The Committee's work and mandate are distinct from those of the Ontario Energy Board Modernization Review Panel. The Panel is an advisory body convened by the Government of Ontario to consider governance and the

operational framework of the OEB, whereas the Committee's work focuses on innovation and supporting regulatory reforms.



enabler of innovation and one that applies across the spectrum of business, consumers, policy makers and regulators. The latter has to do with how markets perceive risk in regulation. A concern is that uncertainty regarding regulatory reform can negatively impact the way utilities fare in capital markets and can also impact how attractive the energy sector is to investors. A thoughtful and transparent process of regulatory change can actually alleviate risk of sector disruption. The OEB needs to take these broader cultural and market issues into consideration when implementing regulatory reform.

The Committee has focused its attention primarily on innovation and reforms to the regulation of the electricity distribution sector. However, the broad actions identified may extend beyond electricity distribution as opportunities for change arise in other areas that the OEB currently regulates, including gas distribution and storage, electricity transmission, generation, and the IESO-administered markets. Also, the Committee notes structural differences that exist between the electricity and gas sectors may offer insights into how regulatory regimes impact the ability to innovate.

The Committee believes its recommended actions are well suited to serve as a springboard for discussions at OEB consultations on the development of policies needed to support innovation in the sector, including how the recommendations in this report can apply to the gas sector. This is important if there is further convergence of these sectors in providing energy services to customers, for

example, through fuel switching. As a general matter, the Board has recognized the value of symmetry in the economic regulation of electricity and gas distribution and that value may continue to apply when the Board considers how its current regulatory approaches may impede innovation.

In the consultations that address these recommendations, the Committee is confident that the business issues and actions it has identified can be more deeply examined in the Ontario context, and that policy options will be informed by jurisdictional review, empirical analyses, and the perspectives of stakeholders. And, of course, the OEB will be guided by its statutory objectives. The Committee believes, given the scope and complexity of the issues to be addressed, full sector engagement is required.

This report is structured as follows: a summary of recommendations precedes a more detailed discussion of each one. Examples of reforms underway in other jurisdictions are not endorsements; they are included to illustrate alternatives and potential lessons learned that may inform the OEB's consideration when it develops an approach suitable for Ontario. The report ends with thoughts on engagement and the sequencing of recommended actions.

The Committee is pleased to provide its recommendations to the Chair of the OEB.



This paper represents the advice of the Committee as a whole to the Chair of the OEB. It is not a consensus report or meant to represent the position or opinions of individual Committee members or their organizations. Accordingly, the positions and opinions of members and their organizations may not be reflected in the report, which is without prejudice.



Recommendations

1. Provide a Transparent and Level Playing Field

Consistent rules of engagement provide predictability and transparency to parties about their rights and responsibilities when engaging in various activities. To facilitate growth in new service arrangements that will deliver greatest value for consumers these concepts must be extended to and embrace new players in the marketplace. The OEB should further promote innovation through the following actions:

- A. Improve the transparency and consistency of the distribution system connection process and clarify cost responsibilities to reduce uncertainty for DER proponents, utilities and consumers
- B. Establish clear rules for DER integration into distribution systems, addressing technical matters including information, visibility, management and control to, among other things, protect the reliable and safe operation of the distribution system, and optimize the planning and management of resources and assets
- C. Establish guidelines for commercial arrangements governing performance of non-traditional resources so utilities and others can rely upon them as alternatives to traditional system investment
- D. Reexamine regulatory restrictions on utility business activities and review the separation of regulated and competitive services in light of new technologies and service expectations



Provide a Transparent and Level Playing Field

1A. Improve the transparency and consistency of the distribution system connection process and clarify cost responsibilities to reduce uncertainty for DER proponents, utilities and consumers

The OEB's framework around distribution system cost responsibility for connections aims to minimize cross-subsidies among consumers. Under current rules, which set out the process and timelines for connecting generators, utilities have significant discretion over connection requirements. Allowing utilities a degree of judgement is appropriate given utilities' responsibility to maintain the safety and reliability of their systems and that varying system configurations require different technical solutions.

However, consistency within and among utilities can make it less cumbersome for service providers to do business in Ontario. Transparency about how connection costs are determined can create more certainty for DER and other projects. It can also improve project development timelines. A process that encourages collaboration between utilities and proponents on configuration alternatives should support better outcomes.

Renewing the framework for connection processes and cost responsibility at the distribution level with a view to enhancing consistency and transparency, and considering its applicability to all forms of DERs, should be positive for all participants. A beneficial feature of the framework would be a timely and accessible process to resolve disputes between any interconnecting party and a utility.

1B. Establish clear rules for DER integration into distribution systems, addressing technical matters including information, visibility, management and control to, among other things, protect the reliable and safe operation of the distribution system, and optimize the planning and management of resources and assets

Distribution networks are part of a complex and dynamic system of supply, transport, and consumption of electricity. Utilities are responsible for providing a reliable delivery service and are expected to deliver that service efficiently. DERs on the distribution network beyond some level of penetration can create challenges to meeting those obligations and expectations.



Utilities can and do establish the means to protect their systems from adverse safety and reliability effects through automated protections and through utility control of

The California Public Utilities Commission provided guidance to the sector on storage providing multiple services to different entities or jurisdictions. The guidance addresses many issues related to the commercial development of storage, including the dependability of the services.

California Public Utilities Commission. (January 2018). Decision on Multiple-Use Application Issues

isolation devices. For facilities located behind a customers' meter, utilities have little visibility let alone control of the output of the facilities. In some circumstances utilities simply limit how much supply can be connected to their network. If a utility has little or no visibility of a facility's operation and has no capability to manage it, whether directly, or through market signals, it has little option but to use these blunt instruments. These approaches will ensure reliability but do not take full advantage of the capability of distributed energy resources to be used to their potential in optimizing the operation of the distribution network and the broader system of which it is a part.

There are various ways that give a utility visibility and the ability to manage the output of any DER connected to its system to meet reliability obligations and optimize distribution assets as well as the DER. Options such as explicit regulatory

obligations, facilitation of bilateral commercial arrangements, implementation of advanced distribution energy management systems, and development of new distribution-level markets, should be considered by the OEB. To the extent that DERs impact the integrated power system, new tools must be developed in concert with the distributor, DER proponent, the transmitter and the IESO.

1C. Establish guidelines for commercial arrangements governing performance of non-traditional resources so utilities and others can rely upon them as alternatives to traditional system investment

New technologies and business models create the opportunity for utility reliability and service quality obligations to be met using assets other than poles and wires, or by purchasing services.

If utilities are going to rely on other service providers or their customers services that displace distribution network investments, they will need to be assured that those services will be available when needed. Clear requirements for providing that assurance and consequences of not doing so will be needed.

Guidelines could pertain to a range of issues such as management and control, and consumer protection. To the extent that these can be standardized, it will give certainty to service providers and



customers. It should also help overcome the challenges associated with diverse capabilities among utilities.

1D. Reexamine regulatory restrictions on utility business activities and review the separation of regulated and competitive services in light of new technologies and service expectations

Key questions in any discussion of the transformation underway in the energy sector are which activities need to be regulated, which should be competitive, and who may engage in each.

Customer needs are increasingly being able to be met by various technologies and service providers. Standard power quality from the grid may not always be sufficient for some customers, whereas others might prefer to pay less for a lower level of power quality. As utility customers take control of their energy bills and invest in their own solutions for reliability and power quality, the lines between regulated and non-regulated services are blurring.

The challenge for the regulator is to balance two important considerations. On one hand, the regulator must continue to ensure that monopoly service providers do not undermine competitive markets. Similarly, regulation should not create artificial monopolies, such as by deeming competitive services to be core distribution activities. On the other hand, the basic

level of universal service, which is a social good, must continue to be available and broadly funded in order to provide a safeguard against erosion in service quality and cost performance for those who cannot self-supply.

Restrictions on regulated business activities have limited a utility's ability to offer new and differentiated regulated services. Unduly limiting the activities that utilities can engage in may impede the development of the most cost effective solutions in the future. The traditional regulatory view of universal reliability and service obligations of utilities may need to be redefined so that utilities can offer different services to different customers in ways that are more

Other regulators are turning their minds to this issue. For example, New York's Public Service Commission is establishing a process to differentiate competitive and regulated activities to determine how to treat revenue streams associated with facilitating a distribution-level market.

New York Public Service Commission. (May 2016). Order Adopting a Ratemaking And Utility Revenue Model Policy Framework 14-M-010

affordable, of greater value, or more innovative. Exploring this issue might also involve consideration of whether any regulatory obligations need to apply to entities who engage in distribution services but are currently exempt from OEB regulation.



Recommendations

2. Remove Disincentives to Innovative Solutions

Putting nontraditional alternatives on an equal footing with traditional utility solutions can support pursuit of least-cost solutions with greatest value for consumers. To achieve this, the OEB should:

- A. Remunerate utilities to make them indifferent to conventional or alternative solutions, including when other parties own and provide the alternative solution. Considerations will include, among other things, meaningful incentives and moving away from traditional rate base regulation
- B. Establish an empirical evaluation methodology for cost-benefit comparison so all proposals are evaluated on a fair and consistent basis. Elements such as the value of optionality (i.e., the benefit of having options down the road), flexibility, location, time, resiliency, optimizing existing assets, and externalities as appropriate should be considered
- C. Establish a way to ensure DERs can be compensated for their services commensurate with their value while paying their appropriate share of system costs. The approach should recognize new revenue streams which may be aggregated and allow shared cost recovery
- D. Consider timely funding mechanisms to encourage utility innovation that provides near term customer benefits



Remove Disincentives to Innovative Solutions

2A. Remunerate utilities to make them indifferent to conventional or alternative solutions, including when other parties own and provide the alternative solution. Considerations will include, among other things, meaningful incentives and moving away from traditional rate base regulation

Utilities should be encouraging innovative solutions, including DERs, to meet their system needs when they are cost effective to do so. However, some utilities say, under the current revenue model, that they are not rewarded equally for their own versus alternate solutions. This arises from the fact that utilities earn a rate of return on capital but not on operating expenses. Some innovative solutions involve operating rather than capital expenditures – for example, a contract for demand-response to relieve congestion. Another example, from other sectors that have undergone similar transformations, is contracting for “software as a service” and data-driven solutions rather than making large investments in computer hardware. Other utilities say that this does not impact their decision-making and noted that the Board has several regulatory instruments that constrain capital investment, such as

extensive prudential review and earnings sharing.

Pursuing least-cost solutions financed through operating expense may also be inhibited by price cap incentive regulation, which drives utilities to achieve efficiencies that lower their operating costs.

There are a range of approaches to achieving this, from targeted, benefit-sharing structures to more fundamental changes to conventional utility regulation. The UK's Office of Gas and Electricity Markets has adopted a “TOTEX” approach which includes the concept of allowing a return on total expenditures. The California Public Utilities Commission is piloting specific incentives to drive certain behaviours, for example, by allowing utilities to earn a profit margin on the value of contracts with third party DER providers.

Advanced Energy Economy Institute. (January, 2018). *Utility Earnings in a Service-Oriented World*

The OEB expects utilities to employ rigorous asset management processes to identify, pace and prioritize their investments. Without a change in the model for remuneration there is limited incentive to change from the past pattern despite the availability of new options that might provide the best long-term value for customers.



Removing any incentive for the utility to prefer one kind of spending over another should also provide customers and service providers more confidence that innovative solutions will be considered equally in the utility's planning process. The OEB should assess the range of options on their merits in a manner that considers both benefits and potential risks.

A key regulatory consideration will be how best to allocate the benefits of a third party solution between a utility and its customers. This will be particularly important when the solution involves the utility procuring the services of a third party that displaces an equivalent or more expensive investment by the utility.

business case for typical capital investments is tried and true; utilities have experience assessing asset-based options and defending them in an OEB hearing.

Common evaluation methods have been established elsewhere. A notable example is New York's direction to utilities to develop Benefit-Cost Analysis Handbooks setting out common methodologies for evaluating alternatives.

New York Public Service Commission. (January 2016). Order Establishing the Benefit Cost Analysis Framework

2B. Establish an empirical evaluation methodology for cost-benefit comparison so all proposals are evaluated on a fair and consistent basis. Elements such as the value of optionality (i.e., the benefit of having options down the road), flexibility, location, time, resiliency, optimizing existing assets, and externalities as appropriate should be considered

One of the reasons utilities may not pursue innovative solutions is that developing a business case and defending it before the regulator and intervenors is more challenging and involves more uncertainty than continuing with the status quo. The

Innovative solutions may offer benefits that conventional solutions do not. Benefits such as optionality need to be captured to reveal alternative solutions that deliver long-term value, especially given that demand may be increasingly difficult to predict. For example, a distribution line amortized over its typical 45-year service life may appear less expensive than a battery amortized over 10 years. However, if the line is stranded in 10 years because demand is not what it was predicted to be, then the battery may have been the better investment. The flexibility to avoid stranding is a benefit that needs to be captured. At the same time, the Committee recognizes benefits such as these may not have been previously considered in an OEB hearing, and they may be challenged and tested more aggressively as a result, creating greater regulatory uncertainty.



Establishing a common evaluation method that accounts for all benefits associated with any particular solution will help put innovative solutions on equal footing with their traditional counterparts. It will also provide regulatory predictability when utilities bring forward innovative solutions since they would not have to justify the benefits included in their business case and how they were determined. It will aid the planning process by ensuring consideration can be given to all of the attributes of various alternatives.

2C. Establish a way to ensure DERs can be compensated for their services commensurate with their value while paying their appropriate share of system costs. The approach should recognize new revenue streams which may be aggregated and allow shared cost recovery

DERs can provide a variety of services to customers and utilities. For example, a storage solution can provide reliability assurance for a customer, a means of avoiding network investment for a distributor or a transmitter, and ancillary services for the system operator. Currently, some services are not valued and rewarded, particularly at the distribution level.

Today, DERs can be paid to provide services directly to customers. There are also well-established rules for services

provided to IESO-administered markets. There are no such rules at the distribution level. Providing clarity and consistency on compensating DERs for their services, including appropriate valuation, could

Other regulators are adopting a wide range of approaches to address this issue. New York's platform service provider model is intended to address monetization of DER services. In this model, utility revenue may become more transaction-based rather than asset-based. At the other end of the spectrum, jurisdictions such as Hawaii and Nevada are looking at basing net-metering tariffs on the value provided, rather than on the retail cost of electricity.

New York Public Service Commission. (May 2016). Order Adopting a Ratemaking and Utility Revenue Model Policy Framework 14-M-0101

support growth of these types of arrangements. Distributors would then have a broader range of solutions to help them optimize their systems. Capacity relief, voltage regulation, and loss mitigation are examples of specific services that could be purchased from DERs.

Furthermore, some of the services DERs can provide to others in the market require the distribution system for their delivery, yet there are limited ways (i.e., through the approval of a new specific service charge) to compensate distributors for facilitating these services.



2D. Consider timely funding mechanisms to encourage utility innovation that provides near term customer benefits

Currently, utility proposals for new and innovative technologies or business models are made through the rate application process. The large majority of utility costs to be covered by rates are for serving customers using established technologies. Any requests for funding through rates of new approaches are typically small in comparison.

Jurisdictions such as California, New York and the United Kingdom have reduced barriers and used consistent ratepayer funding models to drive change.

In the UK, three sources of funding are available to gas and electric utilities for innovative projects: a utility allowance, as a percent of revenue, for small projects related to their own networks; a pooled fund for research, development and demonstration of new technologies; and a pooled fund to help utilities transition a proven innovation into business as usual. Access to the latter two funds are on a competitive basis.

Office of Gas and Electricity Markets. (December 2017). RIIO Electricity Distribution Annual Report 2016-17

Innovation can entail a higher than normal risk that a proposal will fail to deliver benefits to consumers. There is a concern that the rate-setting process may not be the most effective venue for exploring bold new approaches. This may hamper proposals from being brought forward.

Gas and electric utilities can accelerate the cost-effective commercialization of innovations. Allowing utilities a relatively small amount of funding, collected through rates but separate from normal business operation and deployed with an efficient level of oversight may be an effective means of encouraging breakthrough approaches. Utilities often have the scale, reputation or markets to provide a launch pad for introducing innovative products.



Recommendations

3. Encourage Market-Based Solutions and Customer Choice

Information transparency is key to developing and deploying new market-based solutions. It expands the options for utilities to consider in their service offerings and enables informed consumer choice. In order to facilitate better access to information, the OEB should:

- A. Require utilities to publish information about the characteristics and capabilities of their systems to enhance transparency of distribution system needs and capabilities within the market
- B. Encourage cost-effective investment by utilities in monitoring and control capabilities to the extent that these enabling investments will help them efficiently manage a more dynamic distribution system



Encourage Market-Based Solutions and Customer Choice

3A. Require utilities to publish information about the characteristics and capabilities of their systems to enhance transparency of distribution system needs and capabilities within the market

In order to develop innovative solutions for utilities the market must know what they need. If a basic level of information about distribution system needs is available – currently there is no requirement or incentive to do so – the market can respond.

Transparency of distribution system characteristics and capabilities can also support efficient customer- and market-led solution deployment. The value of resources can be quite different depending on where they are located on the network and when they are used. Factors such as how easily new resources can be accommodated in a given area (sometimes referred to as “hosting capacity”) and opportunities to sell utilities services located to relieve capacity constraints can inform both consumer investment decisions and the development of market services.

Revealing distribution system needs and capabilities to the market can generate

value for consumers in two ways. First, there is value in broadening the range of options considered by a utility to help them identify least-cost solutions with long-term value. Second, there is value in revealing more opportunities for consumer and market-led investment.

This being said, there are a number of considerations that the Board should consider in determining what data should be provided and who should have access to it. These considerations include safety, privacy, security and commercial sensitivity.

In New York, each utility is required to publish a map identifying areas where higher project compensation is available to meet an acute need. Zones, capacity caps, and values are approved by the Public Service Commission.

In Ontario, bulk system needs are revealed each quarter as the IESO publishes its 18-month outlook describing zonal demand and supply characteristics, system capability of interfaces between zones, and energy flow on those interfaces. Market information is available to identify constraints on the system.

New York State Energy Research & Development Authority. (October, 2017). Summary of Value of Distributed Energy Resources

Independent Electricity System Operator. (October, 2018). 18-Month Outlook



The Committee believes the market may value more granular distribution system information, beyond a basic level to be made available to all. Other service providers may be willing to pay for information beyond the basic level to help them develop service offerings. Currently there is limited information available about the injections or withdrawals of energy and even less about other attributes like voltage and momentary service interruptions. Where information is available, it is often on a timescale (e.g., monthly, daily, hourly) that is too long to be useful. This additional level of information may be a new value-added, user-pay utility service offering and could be an example of a differentiated utility service.

An important factor to consider – whether basic or more granular information is provided – will be ensuring privacy and security measures are central to the design of an approach for making information available.

3B. Encourage cost-effective investment by utilities in monitoring and control capabilities to the extent that these enabling investments will help them efficiently manage a more dynamic distribution system

Utilities install monitoring and control equipment to be able to know what is happening on their system and to be able to take action to isolate problems and restore service to customers. As new

technologies have begun to connect to their networks and to their customers' facilities, managing the reliable operation of their systems has become more complex. At some level of penetration of DERs, utilities will not be able to effectively plan and reliably operate their systems if they do not have visibility of and the ability to manage all facilities that are using or impacting their systems. This could result in legitimate denials of connection or limitations on dispatch for reliability reasons. It could also prevent new resources from being managed in a way that optimizes their functionality to the benefit of the system

Eventually, if enough new resources are connected to distribution systems, they will have to be dynamically managed similar to the bulk system. We may need a distribution system operator(s) with many of the capabilities of the IESO. If a true retail market develops for competitive services, the capabilities of the distribution system operator will be even more important. Ideally, the installation of monitoring and management equipment will precede the need, thereby facilitating cost effective deployment of DERs. Therefore, it needs to be considered early in the planning process.

Monitoring and control equipment paired with intelligent analytics can maximize capabilities. This is a key learning from the telecom sector – with the advent of cellular technology was the need for investment in advanced software and data-driven solutions, particularly big data analytics, as an alternative to traditional hardware.



Supportive regulatory guidance could be developed to increase utilities' confidence to propose these enabling investments. Progressive improvements in monitoring and management capability are an important part of realizing the full benefits of energy sector transformation. Furthermore, these enabling investments can also serve multiple future designs for the sector, including potential for transactive markets at the distribution level.



Recommendations

4. Embrace Simplified Regulation

Regulatory processes serve an important purpose but their complexity and pace is not conducive to deployment of innovation. Consumers, utilities and innovators in the sector need a simple and timely way of trying things out and learning from their experience. Regulatory simplicity will result in better pathways for innovation. In order to embrace simplified regulation, the OEB should:

- A. Provide a means by which both utilities and unregulated entities are encouraged to discuss specific regulatory obstacles with the OEB, in order to allow near-term deployment of innovations while longer-term regulatory reforms are implemented
- B. Review the information the OEB collects to ensure it is used to evaluate performance in the sector – specifically whether utilities, other service providers and regulation itself are benefitting customers
- C. Explore the use of self-executing processes that use transparent, pre-approved criteria to allow streamlined regulatory review
- D. Further examine OEB decision timelines to determine whether they can be shortened without compromising the effectiveness of stakeholder participation



Embrace Simplified Regulation

4A. Provide a means by which both utilities and unregulated entities are encouraged to discuss specific regulatory obstacles with the OEB, in order to allow near-term deployment of innovations while longer-term regulatory reforms are implemented

It is unclear whether the OEB's outcomes-based approach to regulation has advanced innovation in the sector to the extent it was intended. The complexity of utility filings and the adversarial nature of OEB hearings may be an obstacle to innovation and experimentation by consumers, utilities, and innovators.

Consumers, utilities and innovators in the sector need a simple and timely way of trying things out. This can be done by creating a venue in which proponents – whether regulated utilities or competitive service providers – can bring forward innovative projects, identify regulatory constraints and illustrate the benefits if a particular regulatory barrier were addressed. It would enable the OEB to 'pilot' innovative regulatory approaches. Such a forum, commonly called a 'regulatory sandbox' in some jurisdictions, may reveal opportunities for proponents to proceed without further regulatory review or intervention, or afford the opportunity for

temporary relief of regulatory requirements for a trial period.

Setting aside conventional regulation and allowing utilities to use a regulatory sandbox will be a key modernizing tool that utilities can use to streamline adoption of innovation. This is crucial to reducing any barriers to innovation in conventional regulation. A sandbox may also help the OEB to ensure that current enabling policies (e.g., conservation and demand management allowances and infrastructure investment incentives), are

In the UK, the Office of Gas and Electricity Markets has implemented a "regulatory sandbox" to enable innovators to trial business products, services and models that cannot operate under existing regulations. What it calls "fast, frank feedback" is available to assess whether a proposal could operate under the current regulatory framework. If regulatory barriers exist, innovators can then apply for trial regulatory treatments to support their proposal.

Office of Gas and Electricity Markets. (October 2017).
Regulatory Sandbox Window 2 Guidance

effective and encourage utilities to take full advantage of them. Clarity and simplicity in processes are the essential elements for this approach to be a success. Development of a simplified framework can help overcome speed and scale issues allowing flexibility to do what is best for customers and quickly implement innovative technologies.



4B. Review the information the OEB collects to ensure it is used to evaluate performance in the sector – specifically whether utilities, other service providers and regulation itself are benefitting customers

Information about utility operations and performance is a cornerstone of performance-based regulation. While seemingly burdensome, it has the potential to make regulation less intrusive than traditional cost of service style regulation, which scrutinizes utilities' spending and decision-making. This less intrusive approach would require a commitment by hearing panels to ensure that hearings do not simply replicate cost of service reviews and that decisions are focused on the evaluation of performance against objective performance standards.

The information that the OEB collects to support its regulation could also serve market development. In other recommendations, the Committee identifies the need for better information sharing. To the extent that the OEB is

In the United States, the development of sophisticated benchmarking models by energy regulators and utilities has been enabled by data that has been gathered over the years by the Federal Energy Regulatory Commission.

Federal Energy Regulatory Commission. (September 2018).
Form 1 - Electric Utility Annual Report

already collecting the information, efficiencies can be achieved if the information were made public. It could be synthesized into a useful Ontario energy sector resource and made publicly accessible in a user-friendly way.

The OEB should periodically review its reporting requirements and eliminate any that do not meaningfully contribute to its oversight of the sectors.

4C. Explore the use of self-executing processes that use transparent, pre-approved criteria to allow streamlined regulatory review

Recommended enhancements to regulation described in this report should facilitate streamlined approvals. Once utilities choose from a broader range of solutions that are valued and rewarded in a consistent manner, less granular scrutiny of investment proposals should be needed. The OEB should take this a step further by establishing a streamlined, self-executing process.

Using this approach, proposals selected and planned in accordance with prescribed criteria would require no further regulatory approval to proceed. Any after-the-fact review of utility performance would focus on learning from experience in the interests of continuous improvement rather than on a hindsight critique of what a utility could have done differently. For instance, the OEB could set standards for a distributor's comparison of in-house options



with external options. Any distributor following that process would meet the requirements of prudence without further review. This approach should facilitate more innovation during a multi-year rate term, and would enhance the OEB's outcomes-based approach to regulation.

and how its regulatory processes can be shortened.

4D. Further examine OEB decision timelines to determine whether they can be shortened without compromising the effectiveness of stakeholder participation

The current length of many rate cases is not consistent with innovation. Within the time it takes for a rate case to be adjudicated, much can change in the sector outside of a regulated utility. Utilities have an important role to play in enabling and adapting to innovation to create value for consumers, either directly through delivering energy more efficiently, or indirectly by enabling new innovative services offered by other service providers. The regulator has an important role to ensure those they regulate are prudent with ratepayer dollars and that they uphold their obligation to serve all customers at a reasonable cost.

The Committee notes that the OEB is in the midst of a review of its adjudicative model with a view to introducing proportionate regulatory reviews. To the extent that lengthy regulatory approval processes hinder the deployment of innovation in Ontario, the OEB should consider whether



Engagement and Sequencing

The Advisory Committee on Innovation was asked by the Chair of the OEB to identify actions the regulator could take to create an environment to support innovation that brings value to customers.

The broad actions described in this report should help to support cost-effective innovation in energy services. A rules-based approach to regulatory approval should provide greater transparency and certainty in the sector. Changing how utilities are remunerated should encourage them to select from a broader range of choices to serve their customers. Making information available in the market should spur development of more energy services. Simplified regulation that supports utilities, innovators, and customers should accelerate sector innovation. The recommended actions can accommodate a range of possible futures.

The scope of the Committee's recommended actions suggests a need for multiple policy development streams that coordinate and accommodate timely and appropriate deliberation of regulatory reforms. The actions are well suited to serve as a springboard for discussions at OEB consultations. The Committee encourages all sector participants to engage with the OEB in these consultations.

The Committee was also asked for its help on prioritizing and sequencing of actions. Some actions can proceed independently, while others are intrinsically linked and

would benefit from a coordinated approach. For example, work to improve the connection process and work to make distribution system characteristics available can proceed quickly and in parallel. Progress on these fronts can inform work on commercial arrangements, DER integration and compensation. At the same time, looking at how utilities are remunerated, while complex and thus likely to proceed in a measured way, can be initiated quickly and independently. This may also be the case for developing an empirical evaluation method to compare alternatives. Furthermore, while implementing a regulatory sandbox can get underway soon, examination of funding mechanisms could inform the evolution of the sandbox. This illustrates the complexity and potential interrelationships between the issues and actions.

As a next step, the Committee suggests that the OEB host a stakeholder event (perhaps along the lines of a FERC technical conference) to get broader input on subsequent OEB work, including prioritizing and sequencing of actions. Figure 1 on the next page illustrates the Committee's thoughts on sequencing and an indicative timeline.

To help the Committee understand the potential impacts of its recommendations on the OEB's regulatory framework, it endeavored to map each proposed action against key elements of the OEB's regulatory framework. Table 1 summarizes potential regulatory touchpoints for OEB consideration.

Advisory Committee on Innovation



Figure 1: Recommendations - Indicative Timeline

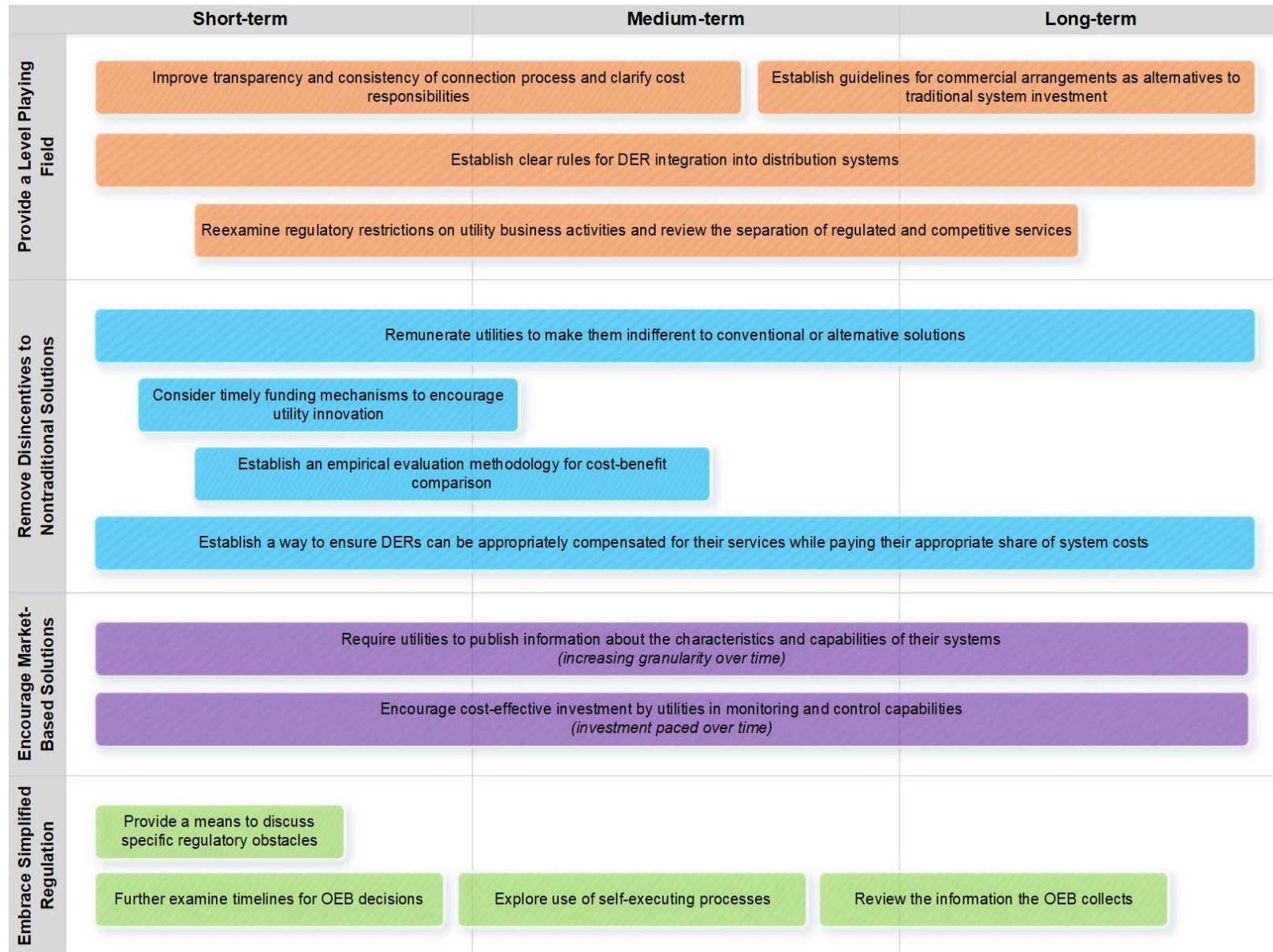




Table 1: Regulatory Touchpoints

Recommended Actions		Licensing	Codes & Rules	Guidelines	Rate Regulation	Service Quality	Performance Monitoring	Audit	Compliance	Decision-Making
Level Playing Field	Improve transparency and consistency of connection process and cost responsibility		●				●	●	●	
	Establish clear rules for DER integration into distribution systems		●				●	●	●	
	Establish guidelines for commercial arrangements as alternatives to traditional system investment			●						
	Reexamine regulatory restrictions on utility business activities and separation of regulated and competitive services	●	●	●				●	●	
Remove Disincentives	Remunerate utilities to make them indifferent to conventional or alternative solutions			●	●		●			
	Establish empirical evaluation methodology so all proposals are evaluated on a fair and consistent basis			●						
	Ensure DERs can be compensated for their services while paying their appropriate share of system costs		●	●						
	Consider timely funding mechanisms to encourage utility innovation			●	●		●	●		
Market- Solutions	Require utilities to publish information about the characteristics and capabilities of their systems		●	●		●	●	●	●	
	Encourage cost-effective investment by utilities in monitoring and control capabilities			●		●	●			
	Provide a means by which both utilities and unregulated entities can discuss specific regulatory obstacles with the OEB			●						●
Simplified Regulation	Review the information the OEB collects to ensure it is used to evaluation performance in the sector						●			
	Use self-executing processes that use transparent, pre-approved criteria to allow streamlined regulatory review			●						●
	Further examine OEB decision timelines to determine whether they can be shortened			●						●



Appendices

Committee Membership

Brian Bentz - President and CEO, Alectra Inc.

A J Goulding - President, London Economics International LLC

Anthony Haines - President and CEO, Toronto Hydro Corp.

Cynthia Hansen - Executive Vice President, Utilities & Power Operations, Enbridge Inc.

Krista Jones - Managing Director, Work and Learning, MaRS Discovery District

Nicole Martin - Senior Director, Standard & Poor's Global Ratings

Paul Murphy - Chair Advisory Board, Advanced Energy Centre at MaRS

Jason Sparaga / Andrew Clark - Co-Founders and Co-CEOs, Spark Power Corp.

George Vegh - Counsel, McCarthy Tétrault

Adam White - Founder and CEO, Powerconsumer Inc.

Joshua Wong - President and CEO, Opus One Solutions



Committee Process

The Committee held a series of discussions over the last eight months structured around the following themes; new services, value and pricing, planning, and remuneration. Early meetings focused on identifying and describing business issues – particularly issues utilities, innovators, consumers and the regulator face when pursuing innovation. Later meetings focused on identifying potential actions the regulator could take to address those issues.

Committee members engaged in open discussions supported by material prepared by OEB staff and by presentations by committee members. While Committee discussions were assisted by external studies and reports, particularly those from MIT and Mowat, the Committee drew heavily on the practical experience and knowledge of its members. Primary research was not carried out. All materials prepared by OEB staff and other reference materials are listed below, as are the summary notes of the Committee discussions.

Links to Committee Materials

[Terms of Reference](#)

[Committee Member Profiles](#)

[Meeting Materials](#)

This paper represents the advice of the Committee as a whole to the Chair of the OEB. It is not a consensus report or meant to represent the position or opinions of individual Committee members or their organizations. Accordingly, the positions and opinions of members and their organizations may not be reflected in the report, which is without prejudice.



References

Advanced Energy Economy Institute. (January, 2018). [Utility Earnings in a Service-Oriented World](#)

California Public Utilities Commission. (January 2018). [Decision on Multiple-Use Application Issues](#)

Concentric Energy Advisors. (April 2018). [Regulator Rationale for Ratepayer-Funded Electricity and Natural Gas Innovation](#)

Electricity Distributors Association. (February, 2017). [The Power to Connect: A Roadmap to a Brighter Ontario](#)

Federal Energy Regulatory Commission. (September 2018). [Form 1 - Electric Utility Annual Report](#)

Government of Ontario. (October 2017). [Long-Term Energy Plan 2017: Delivering Fairness and Choice](#)

Independent Electricity System Operator. (October, 2018). [18-Month Outlook](#)

Jenkins, Jesse D. and Ignacio J. Pérez-Arriaga. (2017). [Improved Regulatory Approaches for the Remuneration of Electricity Distribution Utilities with High Penetrations of Distributed Energy Resources](#)

MIT Energy Initiative. (December 2016). [Utility of the Future](#)

Mowat Energy (December 2016). [Emerging Energy Trends: Regulatory Responses to Ontario's Energy Future](#)

New York State Energy Research & Development Authority. (October, 2017). [Summary of Value of Distributed Energy Resources](#)

New York Public Service Commission. (January 2016). [Order Establishing the Benefit Cost Analysis Framework](#)

New York Public Service Commission. (May 2016). [Order Adopting a Ratemaking and Utility Revenue Model Policy Framework 14-M-0101](#)

Office of Gas and Electricity Markets. (December 2017). [RIO Electricity Distribution Annual Report 2016-17](#)



Office of Gas and Electricity Markets. (October 2017). [Regulatory Sandbox Window 2 Guidance](#)

Ontario Energy Association. (September, 2017). [OEA Energy Platform](#)

Ontario Energy Board. (December 2017). [Strategic Blueprint: Keeping Pace with an Evolving Energy Sector](#)

Ontario Energy Board. (January 2018). [LTEP Implementation Plan](#)

Opus One Solutions. (November 2017). [GridOS Integrated Distribution System Planning](#)