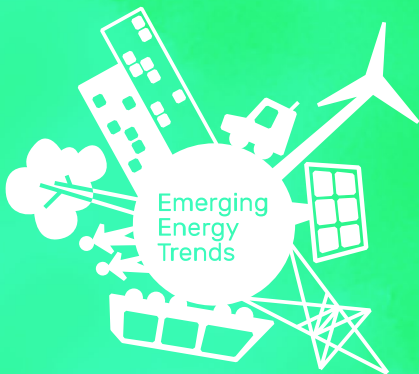


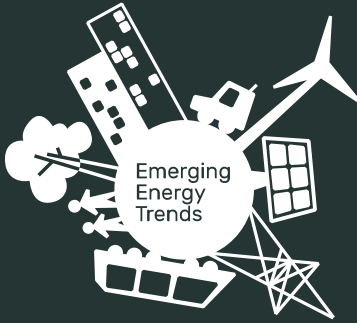
Emerging Energy Trends

Regulatory Responses to
Ontario's Energy Future

CONFERENCE OUTCOMES REPORT



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Mowat Energy's *Emerging Energy Trends* is a comprehensive study of how technological and consumer disruptions in the energy sector could affect Ontario and beyond.

This report is the final report, informed by international research. All reports in the *Emerging Energy Trends* series are available at mowatcentre.ca/emerging-energy-trends.

The Mowat Energy research hub provides independent, evidence-based research and analysis on systemic energy policy issues facing Ontario and Canada. With its strong relationship with the energy sector, Mowat Energy has provided thought leadership to stakeholders, decision-makers and the public to help advance discussions on the challenges that energy is facing in Ontario.

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PREFACE

On May 29, 2017, Mowat Energy hosted an international conference exploring the future of energy in Ontario. This outcomes report is a comprehensive rendition of the proceedings of the conference which includes a detailed description of the discussions that occurred and the panel responses to the very helpful questions from the floor. In addition, links to the Conference Agenda and Speaker Bios, and a video of the entire conference are included in the Appendix.

What emerged from the conference was that there are areas of agreement from a broad range of interests, as well as points of spirited departure. It is no surprise that there remain key areas that require further examination and research, and structured further discussion.

We also learned that jurisdictions all over the world are hard at work in trying to find the right policy responses to unprecedented challenges to the status quo. It is also safe to say that no jurisdiction of which we are aware has arrived at a confident and comprehensive way forward. It is clear that each jurisdiction will have to find the most appropriate and constructive architecture to suit its particular circumstances. No one as yet has found a “silver bullet” solution. In short, Ontario is not alone in trying to create the optimal environment for the second century of energy regulation.

There are significant and costly risks in getting it wrong. But there are also significant gains to be made if the right policy and regulatory measures are adopted.

We know that a more inclusive, comprehensive and structured regional planning process will be an important part of the evolution of our system. All forms of energy need to be engaged to ensure that the opportunities available are taken advantage of, and all configurations of utilities and customers need to be considered.

We know that rate paradigms may have to be reconsidered and refined to assess and reflect the genuine value proposition offered by distributed energy resource installations of all kinds. Locational considerations, key operational challenges, issues of technical conformity and the relations between new and abiding rate classes will have to be confidently addressed.



With this report we were also releasing the video of the conference proceedings which captures everything that was said at the conference. A link to that video appears in the Appendix. We hope you find this useful.

Finally, we would be remiss if we did not address the importance of effective consumer engagement in the processes that we expect will follow as policymakers and regulators develop the next steps in developing the Ontario response. Mowat has done considerable work on this issue, through a number of reports and papers over the last few years, culminating in a co-authored report earlier this year entitled *Representing Consumers' Interests in Ontario*. This report can be found in our *On the Grid* Series.

The presentations at the conference illustrate, among other things, that the emerging energy trends, and in particular the integration of distributed energy resources (DER) into the distribution system, will have potentially profound implications for all categories of consumers including passive residential consumers. Those implications include the availability of technologies to give consumers far greater control over their consumption and use of electricity, the nature and the costs of the restructuring of the distribution system, and the nature and cost of consumers' relations to their fellow consumers. It is critical that consumers be made aware of these implications and be given the opportunity to fully and effectively participate in the planning for and the implementation of the new energy markets. To ensure that, it is essential that consumers be independently represented by their own energy consumer advocate. We cannot pretend that any existing mechanism, whether in the government or the OEB or otherwise, can provide the consumers with the information required for them to make fully informed decisions or to provide independent, forceful advocacy on their behalf. It is also essential, we suggest, that consumer representation be in place at the earliest stages of the planning and implementation process.

Finally, we want to acknowledge the very material contribution of Cynthia Chaplin to the creation of the Outcomes Report.

Welcome Address: Paul Sommerville (Mowat Centre)

Transformative change is happening in the energy market. The system is becoming more decentralized through the adoption of distributed energy resources (DER). This market transformation will necessitate fundamental change to policy and regulation. The goal of the conference is provide a respectful and organized forum for the exchange of ideas around these issues.

While the pace of change may be challenging, careful policy and regulatory analysis is important. We should learn from pilot programs and from work in other jurisdictions. New York, for example, is learning that it can be very challenging to operationalize a comprehensive “vision,” while California has had to address the challenge of legacy obligations.

The conference is designed to provide a platform for the expression of conflicting ideas about how the issues should be addressed. Disagreements are expected about how to manage the change and even about whether we should be trying to manage the change. Attendees were encouraged to engage in the discussion, to challenge the views expressed, and to raise questions on the issues being overlooked.

Key Themes from the Conference

The customer: Is always right

Technology change and declining costs of technology are change in the sector at the customer end. New products, new services and new providers are meeting customer needs. The impacts of DER on the system, utilities and customers may be profound.

The customer needs to be the focus for policy makers, regulators, utilities and third party providers. The customer needs to be the focus for policy, regulatory frameworks, rate structures, service offerings.

Affordability is a key consideration. Rates drive consumer opinion, which drives politics, which drives policy, which drives the sector. Rates also drive customer behaviour, including whether to leave the system. We do not want to create incentives for customers to go off-grid if we can achieve a more reliable and efficient system through their remaining on the grid.

Some customers want deeper engagement; some don't. Some customers will be active in new markets; others will remain passive. We must satisfy all customer needs. Meaningful customer engagement is very challenging, but necessary.



The distributor: What is to be – or not to be?

- » A key issue will be the role of utility and the utility business model in the DER transformation.
- » Distributors have a crucial role given their interface with customers, but innovation and choice can be advanced through competition. Stranded assets are a risk, but there may be opportunities to use infrastructure in new ways.
- » The distributors' role with respect to DER must be determined: Owner? Facilitator? Operator? Aggregator?
- » Distributors will want to engage in competitive activities, within the regulated entity and/or within affiliates. A level playing field will be needed, but will be challenging to set.
- » Distribution rate structures and revenue tools will need to evolve. Utilities should be incented to implement the best solutions, and current incentive structures may not do that.

What matters in DER: Location, location, location

- » Some locations and types of DER can lead to system benefits, including deferred or reduced capacity investments, grid support services, etc. But in other locations, DER can increase system costs.
- » Net metering is a blunt tool which does not reflect locational differences.
- » There should be a principles-based approach to determining the value of DER based on location and other factors, which would then be applied in specific situations.

Process is important

- » Ontario must move forward on policy and regulatory work. Informal processes designed to build consensus have best chance of gaining public (and therefore political) acceptance through mutual gains and transparency.
- » The analysis supporting policy and regulatory work must be rigorous and the process must be transparent.
- » Planning is fundamental. Regional planning has improved the planning process, and can be a platform for multi-stakeholder engagement. Communities are developing energy plans, and these need to be better integrated into regional plans. Broader involvement in the formal planning, including municipalities, communities, customers and service providers, will bring broader ideas and better engagement. Planning should be aligned across different levels of the system and between gas and electricity, and aligned in terms of objectives.



Goldilocks pace: Not too fast, not too slow

- » Technology is changing and policy is changing. There are multiple stakeholders. The result is complexity: technical, operational, policy and regulatory.
- » Ontario should not copy solutions from other jurisdictions, but should learn from them. Identify best practices; identify risks and mistakes.
- » Incremental change is the way to learn as we go.
- » Pilots are important, but not an excuse to postpone systemic changes.
- » Focus on principles, not prescriptions.

Session 1: Regional Energy Planning

Moderator: George Vegh (McCarthy Tetrault)

George explained that the panel would focus on regional planning in the context of current energy trends. He maintained that effective planning can provide the facts and rationale for good policy. He observed that the conference is starting with the planning panel and finishing with the policy panel. This is aligned with the Ontario electricity context, where the government is central and everything ends in policy.

Joe Toneguzzo (IESO)

Joe described regional planning as a systematic process designed to ensure that the electricity needs of customers in a particular area are met. Regional planning looks at growth, service quality issues and emerging issues. The result is a plan for a local area which identifies the required investments by the power system or by customers that are cost effective for all ratepayers. Regional plans form the basis for investments which are included in rate cases, including incremental CDM, DER and wires solutions.

Regional planning is required by OEB and primarily involves the IESO, transmitters and local distributors.

The IESO contributes its knowledge of resource contracts and local bulk system needs. Transmitters contribute expertise related to the feasibility of technically viable alternatives, cost estimates and equipment capabilities. Distributors contribute similar expertise related to the feasibility of distribution alternatives and costs. Distributors also provide the links to customers and communities and carry responsibility for CDM. Customers and communities are becoming more active in the process. Community Energy Plans sometimes provide potential solutions and sometimes create new needs (e.g. electrification projects).



The IESO has completed one cycle of regional planning, and all regions with identified growth or need now have a plan. Most of the plans include wires solutions to address short-term requirements, although many of the plans include recommendations for non-wires solutions in the mid to longer term. Joe concluded that the regional planning process is working well, and it will move forward and evolve. There are some key areas for improvement, including better end-of-life planning, better coordination with Community Energy Plans, and better understanding of how to implement non-wire solutions. The process needs to be able to look at local avoided costs and integrate that with system-level costs (i.e. where there is a local capacity requirement, but no general energy need).

Fernando Carou (City of Toronto)

Fernando commented that we don't want energy to be the tail that wags the dog. Energy is the input; the economy and societal well-being are the goals. Key trends are challenging energy systems. The economy has changed from a manufacturing to a service orientation. The resulting redevelopment of brownfield sites (e.g. CityPlace) presents energy system challenges. Also, cities are growing in different ways – downtown Toronto's population will double in 20 years. Smart growth leads to a focus on infill in urban areas, providing density to support public transport. The city's Official Plan is a key driver for energy needs. There are now opportunities to co-locate energy solutions. For example, transit projects are combined with energy projects, and developments are being combined with energy integrated solutions. Significant innovation is coming from customers. He concluded that it is important to integrate energy needs up front and not after the fact. This is particularly important for Toronto with its vertical growth and big projects like the waterfront revitalization.

Richard Laszlo (QUEST)

Richard brings a community lens on energy systems. Community energy planning is municipally led and is designed to address energy issues in the community. We need to work toward "planning alignment" among municipal planning, electricity system planning, regional planning, bulk system planning and natural gas planning. Although these plans are being done at different scales, there are opportunities for alignment. He explained some of the work that QUEST is doing to bring together distributors, the IESO and local municipalities for closed-door in depth discussions. He identified York region as an example and commented that bringing together all the relevant parties was very productive.

He identified six focus areas for planning:

- 1] Data sharing: Municipalities need to be better integrated into regional planning. They are the source for much of the data, but they aren't feeling engaged.



- 2] Focus on Peak Demand: It's the most expensive electricity and the most polluting. Unfortunately current CDM efforts aren't focused on peak reduction. Ratepayers dollars shouldn't be used for programs that do nothing for peak and which potentially exacerbate surplus baseload.
- 3] Spatial targeting: Investment should be prioritized to where it's most valuable, through energy mapping and spatial planning.
- 4] Convergence around provincial objectives: We don't know the real value of GHG reductions, but this is needed for accurate market signals.
- 5] Alignment of financial and incentive mechanisms: Municipalities have tools to complement provincial programs.
- 6] Enhanced engagement: More work should be done in advance of LAC meeting so the meetings are positive.

Sarah Van Der Paelt (Union Gas)

Sarah explained that Union Gas and Enbridge now have common ownership and they are looking for greater coordination in planning between gas and electricity. Union is preparing 10-year facility plan for filing with the OEB. The process is similar to electricity planning, but is being done in isolation from electricity. There are opportunities for data sharing between gas and electricity, and there is already operational integration between the two systems for managing system requirements, outages and construction. There are parallels between gas and electricity planning processes: both consider growth, reliability and government policy. However, gas utilities are investor-owned, so they are less government driven. More integration between gas and electricity planning is needed – gas provides 75 per cent of the energy requirements of the province. Sarah concluded that regional planning is important because consumers expect resources to be used efficiently, stranded assets are unacceptable and the environment needs to be considered. In addition, the plans must be affordable and facilitate economic development.

Scott Stevens (Northland Power)

Scott brings the IPP perspective. Northland has been engaged in some regional planning processes. He noted that municipal approval processes are central to a developer's plans and often the most difficult, and he sees opportunity for regional planning to make the municipal approval processes run more smoothly. Rate impacts should be the key focus in regional planning because there is a risk that local solutions may shift costs to other ratepayers. He also noted the lack of a central regulator and called for improvements in governance. There should also be more rigour in the economic and cost analysis of regional planning solutions and pointed to the level of rigour used by PJM as an example.



He emphasized the need for a complete inventory of requirements and potential solutions, and questioned whether this has been done for all regional plans. Regional plans are weighted to transmission and distribution solutions, which isn't surprising because the process is run by IESO, transmitters and distributors. If others are included in the process, then other potential solutions can be identified.

There are a number of risks in the medium to long term, including resource adequacy, nuclear refurbishment costs, reliance on CDM, the impacts of self-generation on legacy costs, and the risks and costs of significant electrification of current natural gas loads. Scott concluded that contingency planning will be an important element going forward and a shift from centralized power to more distributed power could result in reduced need for centralized wires solutions, which might actually result in system cost decreases.

QUESTIONS AND DISCUSSION

Question: Although there are lots of different planning processes going on, the government frequently makes decisions that affect the underlying assumptions. Who decides on the implementation of these various plans?

- » Joe responded that it depends. Government makes some overall decisions through the long term energy plan. That plan becomes the governing document from which the IESO makes an implementation plan related to the electricity components and various other decision-makers take decisions at other levels. The IESO makes recommendations regarding the bulk transmission plan and there is an attempt to develop a consensus among the IESO, transmitters and distributors at the regional level.
- » Sarah responded that what works in the GTA may well not be appropriate for Thunder Bay, and therefore the regional municipalities should have decision-making authority because they live with the consequences.
- » Scott agreed with Sarah but noted that there is a level of provincial responsibility as well.

Question: In trying to do things like integrating gas and electricity planning do we over-complicate things? Are gas and electricity just basic services that should be straight forward to plan?

- » Fernando responded that Toronto has almost finished integrating energy into city planning through land use requirements and building codes. However, municipalities are franchises of the provincial government, and the electricity picture is complicated because the province wears many hats in the electricity sector.



» Richard agreed that electricity is not “special” and noted that governments used to own and regulate many products and services that are now in the market. It’s a process of letting go, and it’s a long-term process. He cautioned that innovation will not come from government and incumbents; new ideas come from expanding the number of participants.

Question: Is there a bias toward transmission and distribution solutions? Why?

» Joe doesn’t think it’s a bias. The first round of regional planning included a fair bit of catch up and reliability issues and therefore the need for near-term solutions. The process did look at alternatives, including more CDM, targeted CDM and DR, DER, etc. However, because of the surplus energy situation it is more efficient to deliver that abundant energy and capacity through wires. He noted that there is lots of interest in alternative solutions, but they require a business case. Distributors are getting into the competitive side of the business which could influence costs to come down.

» Richard believes the planning is biased, but he emphasized that it’s what the planners know and do so it’s a natural bias. He cautioned that if there are significant long-term investments made in nuclear then it could shut out potential alternative solutions. He observed that Ontario would be constraining its options when the rest of the world is looking for non-nuclear alternatives. He observed that the cycle becomes self-perpetuating: excess energy on the system leads to investment in wires; the resulting transmission capacity leads to investment in centralized generation.

» Sarah responded that rigorous cost effectiveness testing can lead to creative alternatives. For example, the cost of providing pipe to a location maybe high, and other alternatives including LNG or CNG may be more cost effective.

Question: What are the risks around stranded costs? We shifted from coal generation to gas-fired generation, but now we want to reduce the use of those gas assets.

» Scott responded that the cost for carbon changes the economics of running gas generation.

» Sarah responded that these pressures can lead to innovation. Under cap & trade gas utilities have to look to market demand to sustain assets. They have asked customers if they want to turn back their contracts before building more transmission. They are looking at other markets for gas where it is the lower carbon solution, including marine and heavy transport. They’re also looking at renewable natural gas.

Question: The consumer is the final decision-maker. How do we bring the customer in?

» Scott responded that new suppliers and new technologies are customer-focused, for example Nest thermostats and DR aggregation.



- » Richard responded that cost is the only point of leverage. He doesn't see electricity as having the scope of Uber and Netflix to provide a different value proposition. He acknowledged that affordability is a serious issue, and cautioned that some proposals, like switching from gas to electricity for heat, come with an extremely high implicit cost of carbon.
- » Sarah also pointed to affordability issues. She noted that reliability is taken for granted by customers until there is an outage. She pointed to the OEB-mandated customer engagement and noted the challenges they've faced in trying to explain the business. Customer education has to come before engagement.
- » Fernando responded that we tend to overestimate the ramp up of disruptive technologies, but then we neglect them and they overtake us. New growth brings new opportunities. Although energy is a small part of the overall development cost, energy innovation strategy is now part of development planning requirements. Toronto is looking for distributed solutions to central planning issues.
- » Joe responded that planning is including customer engagement and consultation. He noted that they have direct discussions with large industrial customers and with customer representatives as well. As new technology costs decline, the market will help decide.

Session 2: Ratemaking And Distributed Energy Resources

Moderator: Robert Warren (WeirFoulds)

Robert pointed to a recent article in the Globe & Mail (by Konrad Yakabuski) about the long-term cost implications of the Fair Hydro Plan, and the option of going off-grid to avoid those future costs. He noted the variety of potential views: the central planning view of where DER should be; the customer's goal to reduce the costs of electricity; and the economics of technology development by new service providers.

Ira Shavel (Brattle Group)

Ira described the role of rates within a market context: rates translate economics into a tool that drives individual actions. For example, customers in California have installed rooftop solar and moved to net metering to avoid the high price in the last block of the rate structure.

Ontario has seen a significant reduction in the carbon intensity of its electricity system through contracts for wind and solar. However, those costs and flat/declining demand have resulted in higher rates to customers – roughly double for the energy portion of the bill. This creates incentives for customers to install their own systems, at least for those with suitable roofs and access to financing. 4,200 MW of DER is installed in Ontario. The

costs of solar systems are coming down dramatically, and microFIT is still a significant incentive for DER, even at a lower rate.

Ira reminded us that the traditional Bonbright principles for ratemaking still apply: economic efficiency, customer choice, equity and revenue adequacy. These can be achieved through 3-part rates that include an energy component, a demand component and a fixed component. He cautioned that while DER can be deployed to reduce system costs, not every location is the same. DER can also cause increased costs for the system.

Indy J. Butany-DeSouza (Alectra Utilities)

Indy reported that the Alectra utilities have been working on DER integration for a couple of years. PowerStream's PowerHouse pilot began in 2015 with the goal of designing a solar storage solution with benefits for customers and the grid. The pilot includes partners from the private sector. The assets are software controlled into a virtual power plant which allows services to be offered to grid. The project has resulted in customer savings and a two-year deferment of local wires projects. While the work is still in the exploratory phase, Alectra wants to work with partners to ensure effective implementation.

Indy explained that it is important to quantify the benefits of LDC-managed DER, and the OEB needs to be involved. The goal should be to capture benefit streams and maximize the potential. However, ratemaking must also be efficient, which can be tough for DER. For DER in front of the meter, there is a strong argument in favour of allowing utilities to put the assets in ratebase. The utility will be motivated to use the assets strategically and it has a relationship with customers. The analysis is more complicated for DER installed behind the meter, where the goal should be to meet customer needs but not increase societal costs.

Kaleb Ruch (Toronto Hydro)

Kaleb noted that the pacing for how ratemaking issues are addressed is important. He noted that developments in New York are driving a lot of the dialogue, but he thinks Ontario can take a more incremental approach. He noted that Ontario has already done a lot to de-carbonize generation and implement a transparent carbon pricing mechanism through cap & trade.

He also explained that utilities are in a good position to understand the value of DER on the grid. For example, Toronto Hydro is deferring significant investment at the Cecil TS through demand response, spending \$9 million to defer \$30 million at the station. He cautioned that the regulatory framework is not aligned with this, because under a cost of service model the utility only earns a return on rate base, so it is hard to prioritize this type of project. The Brooklyn Queens project is an example worth studying. That approach included ratebase treatment for investments, with depreciation and an ROE



incentive for certain outcomes, but New York is now using a benefit-sharing model. He concluded that Ontario should look at alternatives to conventional incentives.

Geoff Osborne (NRStor)

Geoff explained that the focus of a customer-first approach is on finding out what the need is and then finding the best service to meet that need. Is DER a challenge or opportunity? Those that see opportunity will benefit. He called for more progressive thinking, including a broader view through economic and social value analysis and a longer-term approach. DER can lead to better utilization of existing infrastructure. DER offers flexibility and customers become more empowered around decision-making.

Storage is both load and generation and has a variety of value streams: transmission and distribution deferral, renewable generation integration and ancillary services. NRStor is pursuing four opportunities: utility scale projects to offer ancillary service to grid; commercial and industrial projects to allow greater customer control and Global Adjustment mitigation; and residential aggregation projects through Tesla Powerwalls.

QUESTIONS AND DISCUSSION

Question: Some consumers can't invest in DER. Who bears the costs of those that do leave the grid? What is the risk of stranded assets? How do rate structures address those issues? If Ontario doesn't need a New York REV process, is a case-by-case approach a reasonable way to plan in face of these risks? Should planning protect utilities?

- » Indy responded that many customers still want a utility connection, so there needs to be a framework to value that so other customers aren't bearing the costs. These customers are interested in energy interdependence. If we capture the value of DER and deploy it properly it will mitigate the risk of stranded costs. Utilities plan and evaluate areas of constraint and can take a broad approach to options, including competitive options.
- » Kaleb responded that there are different planning cycles and lengths, but he doesn't see stranded assets as a pressing issue in the next planning cycle. It is an issue to watch because there is likely to be a tipping point. There needs to be ongoing dialogue between customers, utilities, the province and the regulator.
- » Ira responded that New York and California have advanced principles which acknowledge that location matters. He added that there are many different forms of DER, and some impose costs and some are more reliable than others. All of these factors matter for ratemaking.
- » Geoff responded that it would be better to incent distributors to pursue DER, but it is hard to get DER storage into ratebase. He pointed to innovative investment tools, like green energy bonds being used to finance projects in indigenous communities. On

stranded assets, he noted that the focus will be on how to re-use or re-purpose the infrastructure. If there is a death spiral, those that see and pursue opportunities will survive. Consolidation will be led by the most progressive utilities.

Question: What is the impact of the Ontario government's changes to pricing?

- » Geoff responded that price signals are essential, and the price of electricity needs to reflect actual cost. It is hard for new innovative solutions to come forward when price signals are distorted, as they are under the Fair Hydro Plan.
- » Kaleb sees only a marginal change to project economics, because project lives exceed the four-year rate relief under the Fair Hydro Plan.
- » Indy responded that at worst the Fair Hydro Plan delays DER deployment. However utilities have ongoing renewal of infrastructure needs and constraints, so they are always looking at different solutions.
- » Ira agreed that the Fair Hydro Plan delays DER implementation, but he also noted that the costs of the alternatives (solar and storage) continue to come down.

Question: Ontario has gone off coal and made significant investments in renewable generation, but it is still making investments in baseload nuclear generation. What's the role for DER?

- » Kaleb responded that Ontario will continue to have locations of constraint, which will need to be dealt cost effectively, so there will be a role for DER regardless of the level of baseload generation.
- » Indy responded that with a consumer preference for interdependence there will still be investment required in the system.
- » Ira noted that generation from nuclear is zero emission and DER probably couldn't replace all of that capacity and energy. He acknowledged that large nuclear projects crowd out DER, dampen price signals and exacerbate the surplus baseload issue.
- » Geoff responded that both centralized and de-centralized generation is needed, and that DER may defer the need for more centralized generation.

Question: Is net metering appropriate if DER is primarily for the customer's own benefit? Is net metering relevant in light of over-supply?

- » Geoff responded that DER is very broad, and net metering is only one of the ways to deploy DER.
- » Kaleb responded that you have to consider the situation in the province. There are limitations on what net metering can do; it is a blunt instrument. For example, it doesn't include location analysis. New York is starting to have the conversation in its value of DER proceeding. Ontario should think about how to do DER valuation and should take the time to get it right.



- » Indy responded that customers are opting for choice. As DER evolves, net metering issues shouldn't languish; there should be a confluence of regulation and proceedings at OEB.
- » Ira also responded that net metering is a blunt instrument. While it made sense when there was limited penetration of DER, Ontario should think about better ways. He noted that there is a lot of work going on in this area that would be relevant for Ontario.

Question: Should Ontario develop a province-wide principled basis for determining value of DER to system?

- » Ira responded that there are measurable values of energy and deferred assets, but values of externalities are more controversial. All aspects are important to think about, and an appropriate rate structure could monetize those values.
- » Indy agreed there should be a common value and broader approach, not just a pilot-by-pilot approach. The customer benefits from DER, but there are benefits to other customers as well.
- » Kaleb responded that the value stack will change as technology and market changes, for example, as capacity markets develop. There will be a need to re-evaluate DER value. Different actors can spur change: utility proposals, OEB processes or government policy.
- » Geoff responded that an underlying base evaluation is needed, but specific location can have large impact on total value.

Question: Are projects like PowerHouse and Cecil TS DR uniquely available to large urban systems? What are the implications for the smaller utilities? Are there equity issues?

- » Ira responded that DER can be targeted to remote locations, and there are many different opportunities.
- » Indy agreed that smaller communities also have opportunities to use DER projects. Although a case-by-case evaluation is needed, solutions are evolving.
- » Kaleb responded that if we get the ratemaking right, then the economics will follow.
- » Geoff responded that some of the smaller distributors are more incented to find new solutions – e.g. there is a driver to pursue DER if the alternative is to fly in diesel fuel.

Session 3: Utility Business Models

Moderator: Jay Shephard (Shepherd Rubenstein)

Jay opened by reporting on two things he heard in recent conversations about DER. An energy manager for a large institution said it was his job is to reduce exposure to centrally-generated costs by getting off the grid. A second person predicted that there would be wires assets for sale cheap in the future, and he would want to buy them. He then set the stage for the panel with two ideas:

- » Having your business challenged by outsiders is normal in a competitive market. It is also not a new issue for utilities.
- » Most of the options available to utilities involve entering competitive markets. How can we ensure a level playing field? Is a competitive model viable for a utility? Do they have the skillset; are they nimble enough?

Ken Costello (National Regulatory Research Institute)

A business model requires that a company provide value to customers which customers value enough that the business makes a profit. Many customers are becoming more active, wanting more control and/or cleaner options, but most are still traditional in that they glance at the bill and pay. When the landscape changes the business model has to be re-visited if a company is going to survive.

Ratemaking comes down to what services should a utility provide? He noted that there are public policy objectives which mean that utilities are different than regular commercial businesses. They are also advancing social objectives and have more obligations. He identified a number of considerations:

- » Do utilities need to change how services are priced?
- » Should utilities be able to enter into other activities, including competitive markets?
- » Who should deploy innovation: utilities or third parties?
- » What objectives should utilities have? How can these be achieved at least cost?
- » Who decides whether a new model is needed and what it should be? Utilities have a role, but there is also a role for government policy and regulatory policy.

He concluded that Ontario should watch what the leaders in California and New York are doing and see whether it goes well or badly, and then adjust accordingly.



Steve McGill (Enbridge Gas)

Steve began with the observation that utility business models are like the transition from dealing with infants to dealing with teenagers: “It does not change – it just gets different.” Utilities are considered natural monopolies: they invest in expensive long-lived fixed assets and provide dedicated service to a franchise area. Price regulation is used as a proxy for competition. Utilities have typically built their businesses through ancillary services, for example, hot water heater rentals. Enbridge Gas has already gone through a number of transitions: e.g. it originally provided gas lighting for street lights using gas manufactured from coal.

DER is a big issue for electricity; carbon pricing is the big issue for gas utilities. Of key importance is the fact that the systems are integrated. The predominant gas load is for space heating and we don’t need electricity assets to meet that load, especially since electricity costs are high and gas costs are low. Technology advancements are bringing forward tools that can help shape demand and manage costs proactively.

How will utilities respond? Steve concluded that we should look to utility strengths, namely low cost of capital, strong brand, safety culture and diverse customers. The challenges will be getting faster to market and overcoming the low risk tolerance.

Gregory Van Dusen (Hydro Ottawa)

Greg advanced four propositions:

- 1] The existing business model is not durable. Customers love the product, but they are using less and the utility is helping them to use less. There are other means to acquire the product, but how quickly will change occur?
- 2] Don’t write the obituary for distributors yet. They are cultivating a competitive posture. Some may not survive; there will be consolidation. Distributors will diversify their businesses, which has been facilitated through recent legislative change. Hydro Ottawa gets 20 per cent of its revenue from non-regulated business. Competition is 2-way proposition: net metering can provide unfair advantages to some. Demand decline could reverse. Utilities have depth of expertise in many areas.
- 3] We need to manage processes, prescriptions and predictions carefully. Process: informal processes will facilitate dialogue, and Ontario has work to do in this area. Prescription: the OEB’s Renewed Regulatory Framework is principles-based, and the government and regulator should resist urge to prescribe the utility business model. Prediction: don’t prejudge outcomes.
- 4] Business models that put customers first will win out, and utilities have long history with customers.



Gord Reynolds (Spark Solar)

Spark Solar is an integrated energy service provider which developed out of the Green Energy and Green Economy Act. Gord observed that we are at the early stages of a large scale shift that is primarily technology driven. We are shifting from a monopoly system to an integrated network. Distributors will be challenged to respond to emerging markets. Traditional business models will certainly need to change. Distributors will need to focus on the opportunities. While the death spiral is not a foregone conclusion, customized services will be the key. The result will be more a cost effective, smarter, more reliable grid. He concluded that there will be non-utility players and new strategies to meet demands.

QUESTIONS AND DISCUSSION

Question: The typical utility response is to either see an opportunity and pursue growth in scope or to see a threat and pursue a survival strategy based on regulatory protection. Which way will Ontario go?

- » Greg responded that utilities should see opportunities for growth and other businesses, but they have to adapt to change. He acknowledged that some aspects are scary. Distributors should have access to the competitive market via DER, with appropriate safeguards.
- » Gord responded that the utility has inherent advantages, so he doesn't always support allowing utilities to engage in competitive businesses. He noted that many grid-connected generators were denied access due to system constraints, but there was no option for dispute or challenge. He wondered whether this was partly an attempt by utilities to maintain control.
- » Steve responded that there are opportunities for utilities. He cited the examples of renewable natural gas, hydrogen energy storage, collaboration on geothermal installations, micro CHP, district energy, energy storage and natural gas vehicles. Utilities need to use strengths in terms of structure, operations and financial model to advance other lines of business. Culture also has to change.
- » Ken noted that in the telecom sector regulators gave them flexibility to enter new businesses and offer other services. He noted that regulators are generally reluctant to allow entry into non-core activities due to concerns about discriminatory access and cost shifting.



Question: Should all non-monopoly businesses be outside the regulated utility? How should the competitive businesses be regulated? How should we address the level playing field issues?

- » Steve countered with why shouldn't utilities be able to operate in competitive areas? There can be benefits overall to economy. It comes down to cost allocation to ensure there is no cross-subsidy. He pointed to the natural gas vehicle program: for the years when it under-earned, revenues were imputed which the shareholder picked up, but now that there are extra earnings, those are flowing into the earnings sharing mechanism. With carbon pricing they see opportunity in some fleets and heavy vehicles. He suggested some cross-subsidy may be appropriate if you are trying to get things off the ground, for example renewable natural gas.
- » Gord responded that distributors have a role to play, but many distributors are poorly run and are likely to fail at competitive businesses, at the expense of municipal shareholders. He maintained that there should be no cross-subsidy.
- » Greg responded that distributors should be able to offer services in the competitive market. He noted that boundaries and rules already exist through the ARC. He explained that we need to think now about how these activities should be regulated. He suggested discussing these issues in multi-party groups.

Question: Utilities argue that because there are generally low marginal costs to offering competitive services the result is benefits for the customers of the competitive services and the regulated services through economies of scope. Is this valid?

- » Ken responded that there is a social good in utilities offering competitive services, but not if they have an unfair advantage over competitors. However, allowing solar facilities in ratebase is seen as unfair by other providers because the cost is socialized and risk is lowered. The result is a playing field which is not level. It can be hard to identify a level playing field or determine who has the unfair advantage. For example, new technologies might be higher cost and may look for a subsidy. Net metering is a subsidy for competitive solar.

Question: What about the risks to ratepayers and to municipal taxpayers that arise from distributors going into competitive businesses? Does the ARC go far enough?

- » Greg responded that these are valid concerns, especially around DER. He identified ring-fencing as one approach to protect ratepayers. He suggested we may need to look again at the ARC.
- » Ken agreed that ring-fencing can protect ratepayers. He also pointed to codes of conduct to govern the relationships between utilities and their affiliates. These can often be quite strict, and effective if enforced properly.

- » Steve responded that the ARC has worked well and doesn't need to be revised. Enbridge's shareholder isn't a municipality. It has strict controls through corporate processes, and significant discipline around investment decisions. Higher risk activities will require higher returns.
- » Gord responded that distributors shouldn't participate in competitive businesses and offerings through the regulated business. He commented that most electricity distributors are not well governed: boards are dominated by councillors and have little diversity. The level of risk is not appreciated. However, he would welcome the opportunity to work with the unregulated business.

Question: Do some distributors have to die so others survive?

- » Ken responded that technological change was more profound in the telecom sector. Regulators allowed more flexibility for regulated entities to compete with new entrants. He believes there was more potential for value added services in telecom than for electricity. Regulators should perhaps loosen things for utilities so they can compete while still protecting traditional customers.
- » Gord responded that for better or worse we won't let them die, although some will really struggle. Most customers would like their utility to do more, but most that have tried have failed. If utilities want to compete, then should live or die same as others.
- » Greg responded that some may die, but amalgamations are more likely. He maintained that the rules around what the regulated business can do should be loosened.
- » Steve pointed to Enbridge's third-party billing, which services more than 100 entities. He noted that the rules were developed through a consultative process under the OEB. He noted that it has worked successfully, with benefits to ratepayers and a small benefit to shareholders.

Session 4: Policy And Regulatory Evolution

Moderator: Cynthia Chaplin (Consultant)

The future of energy will require an evolution in energy policy and regulation. We would like policy and regulation to work together seamlessly, and we would like policy and regulation to move forward at an optimal pace, both in response to and in anticipation of, market and technological change. However, that ideal will be hard to achieve.

Sarah Petrean (Clean Energy Canada)

Sarah identified the importance of political influence on policy. She noted that New York City is transforming its antiquated electricity system through innovative methods and tools, and although Ontario is taking a slower approach there are some within government who have a different perception, seeing Ontario as a leader. She observed that there is deep entrenchment of political thinking within policy development. The



conversation itself is charged, not just the electrons. She concluded that it will be a tall order to address the politics in electricity policy making, but it is needed.

Julie Girvan (Consumers Council of Canada)

Julie explained that while the development of DER is exciting in terms of more choice and benefits for customers, DER brings new complexity to utility operations and regulation. DER also brings new risks in terms of the costs of new technology and the potential for customers to leave the utility system. Need to find out what customers want, but not just “gold plate” the system. She cautioned that customer needs vary, and all need access to choice and suitable protection (safety, cost, etc.). She called for clarity about government policy objectives in the short, medium and long term. We also need to know what the regulator is going to do – in the short, medium and long term. The regulator should allow change to rate structures and regulatory framework, but needs to focus on customers in the following areas:

- » Cost/benefit analysis.
- » Decisions as to who will provide services.
- » Customer protection mechanisms.

Although some would like more light-handed regulation, she believes more complex regulation is needed to ensure consumers’ interests are protected. She concluded that DER should be addressed in graduated steps.

David Collie (Electrical Safety Authority)

David explained that although some see “behind the meter” as being a mythical land, it’s where the ESA works every day – and has for 100 years. He noted that the transition from consumer to prosumer (from one-way to two-way flows) brings interesting challenges and opportunities as customers are given access to more choices. Infrastructure is being upgraded in homes and businesses, and the changes are bringing complexity to the system in and around the meter. A whole new set of companies is entering the market. Some new entrants are approaching the ESA early in the process to understand the requirements. ESA is agnostic whether it’s the distributor or a third party doing work behind the meter. He concluded that the ESA’s role is changing and becoming more complex; the ESA is responding by moving to more risk-based oversight.

Teresa Sarkesian (Electricity Distributors Association)

Teresa explained that distributors need to meet the needs of customers in the future. The EDA’s recent paper “Power to Connect” sets out a vision for that future for the next 5 to 15 years. It is designed to be a conversation starter to address the issues raised by the policy landscape and by customer demands. Many companies are looking to go off-grid, even out of province. Distributors will change, becoming like mini-IESOs that

enable, integrate, own, and/or control DERs. This will be a much more sophisticated network of power and communication flows, which empowers customers to be more active. The EDA vision is to allow evolution over time with suitable regulatory incentives. Distributors want to expand their scope, to own DER, to act as enabling platforms, and to be aggregators and network operators, all with associated revenue streams. Policy and regulatory frameworks need to go further to accommodate customer demands. New investments will be needed. Smart grid funding approach could be model. Teresa concluded that a multi-stakeholder framework is needed to move these issues forward

QUESTIONS AND DISCUSSION

Question: Increased complexity is one of the challenges facing policy makers and regulators. Which decisions should be made by government, which by the economic regulator, and which by technical regulator?

- » David responded with the example of electric vehicles. This initiative affects many sectors and many ministries and required multi-party work across sectors. He explained that government and regulators each have their role, but they have to work together.
- » Sarah responded that consumers influence public policy decisions. Everyone with a role to play needs to be at the table and the discussions need to take place in a transparent way.
- » Julie responded that government should make policy choices based on economic analysis. The analysis should be focused on what customers want and what's good for system overall in terms of efficiency. The OEB needs to focus on its core responsibility of regulating utilities and achieving a balance between customer and shareholder interests.
- » Teresa responded that government is playing a big role through climate change policy and carbon pricing. Government should clarify the roles and responsibilities and put forward its vision for the system. Regulators will help determine the role of the distributor going forward, and technical regulators will ensure compliance. We need multi-stakeholder processes to have discussions in a formalized way.

Question: Energy policy will continue to be politicized. What are the practical steps to try to ensure policy and regulatory frameworks evolve along principles which have broad support?

- » Sarah pointed out that no matter what decisions are taken today, the 2018 election could lead to change. So we need to look at what fundamentally drives the conversation, which is reliability and cost effectiveness (rates that consumers are willing to pay). How do we involve consumers? Is the complex information around planning also accessible to them? Can we open up the planning process to get more



involvement from consumers so they have a way into the system? These changes would help.

- » David referred to the Smart Grid Forum as an example of a multi-stakeholder, apolitical group which was established at the time of a perceived policy vacuum. They advanced strong position and policy papers. A similar type of forum would be helpful now, but needs to be larger and broader. We as leaders should come together and take this forward.
- » Teresa responded that a more transparent discussion would be good. Distributors were poorly prepared to implement the Green Energy and Green Economy Act. Government should temper its more audacious projects and engage in discussion about the implications of potential policies.
- » Julie supported meaningful multi-stakeholder consultations, and thinks the established processes fall short. Although the government puts out papers for comment, it is often hard to see the link between the input that's given and the decisions that are made. She would also like to see a move to better independence between government and regulator.

Question: You each call for transparent, multi-party, apolitical processes to drive policy and regulatory evolution. What are the priority issues?

- » Teresa responded that one priority issue is electric vehicle charging infrastructure. The government procured EV charging siting and selected a private third party. However, issues arose because distributors were not part of the discussions. More discussion in advance would be helpful.
- » Sarah responded that we need alignment on the desired outcomes. If we understand what each player is trying to achieve then we can all row in the same direction. New technologies are being developed and the cost of new technology is declining which could mean reduced costs overall. We need to align how we are going to achieve both reduced greenhouse gas emissions and reduced costs.

Question: What's the role of consumer and how do we get them involved?

- » Julie responded that meaningful customer engagement is very challenging. Some customers don't care, but others care deeply. In implementing DER we need to find system efficiency and system benefits through the technologies that customers want. Government has to engage customers better.
- » David responded that we need to stop making decisions on behalf of customers. We shouldn't be prejudging what they want in their house.



Question: The Mowat Report identified regional planning as the foundation for the effective emergence of DER. Is regional planning being used effectively to engage customers?

» Teresa responded that all levels of planning can be used to get customer engagement – regional, distributor and community. The different planning levels need to talk to each other and coordinate with the Green Bank in order to have integration and alignment. There are good intentions, but processes need to be streamlined. There should be a review of the first round of regional planning to make improvements. Formal planning has brought more discipline and more stakeholders to the process.

Question: Are the complexities and challenges and costs of market change beyond the capabilities of LDCs? Do we need further consolidation so all have the scale and resources needed?

» Teresa explained that the EDA is agnostic regarding distributor ownership and size. In her view, size does not matter. Smaller system may not require as much complexity as a larger system. The issue will resolve itself through normal business decision-making, and consolidation should remain voluntary. She expects a natural evolution to fewer distributors.

» Julie responded that larger distributors aren't necessarily more efficient or better for customers. Do we want Hydro One to buy customers across the province when those customers may not necessarily be better off? We should look at the most efficient and best performing distributors, regardless of size and identify best practices.

Question: What rules or policies should the OEB introduce to protect distributors from competition around DER (e.g. charge exit fees, allow assets for competitive businesses in ratebase, allow subsidies from the regulated business)?

» Julie responded that distributors should not enter into competitive activities except through affiliates. Utilities should focus on core activities and let others get into these competitive businesses.

» Sarah responded that regulation should ensure that all customers benefit, and she admitted that it is a challenging and delicate balance.

» Teresa noted that one of the OEB's objectives is to facilitate a financially viable electricity system. If customers are leaving the system, we can be sure they will want to return to the system if their technology fails. There must be mechanisms to protect other customers. More work is needed in this area.

» David cautioned that the system needs proper funding to ensure quality and reliability.



Question: Should the federal government play a larger role in Ontario energy policy?

- » David responded that current standards are highly prescriptive. The federal government could help by moving to a principles-based code which could then guide the provincial standards.
- » Teresa responded that the federal government could set the tone in terms of broader principles. However, a national approach might not be welcomed by all provinces.
- » Sarah responded that the conversations are different in each province. The federal government could use “carrots” to encourage provinces to move in a particular direction.

Question: Lots is going on in other jurisdictions, although we can't just apply solutions from elsewhere. What are the key learnings Ontario should take from other jurisdictions at this point - in terms of frameworks and processes?

- » Julie responded that we should learn from the best practices that others have proven.
- » David responded that many US states are watching and learning from California and New York. In many ways Ontario is a leading jurisdiction, but we need to decide what pace to go. Faster may bring about leading edge innovation, but a slower pace will be less risky.
- » Sarah responded that we need to identify the problem we want to solve and decide how to solve it. We are different than California and New York. Pilot projects are good, but we must be deliberate and clear about results or we risk “pilot-itus.” We probably want to be in the middle of the pack in terms of pace.
- » Teresa knows there is a debate around distributor versus competitive suppliers, but distributors are running pilots in collaboration with competitive suppliers. California recently changed its mind and will allow EV charging stations in utility ratebase, because it wants to see them rolled out well across state. New York has introduced DER earnings incentive mechanisms to incent performance, and these will become market-based over time.

APPENDIX

Conference Agenda, Speaker Bios & Videos are on the [Emerging Energy Trends website](#).

Conference video: Many thanks to [Ossington Creative](#), drew@ossingtoncreative.com.



Mowat Centre

ONTARIO'S VOICE ON PUBLIC POLICY

The Mowat Centre is an independent public policy think tank located at the School of Public Policy & Governance at the University of Toronto. The Mowat Centre is Ontario's non-partisan, evidence-based voice on public policy. It undertakes collaborative applied policy research, proposes innovative research-driven recommendations, and engages in public dialogue on Canada's most important national issues.

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