

Evolution of the Vision for the Ontario Electricity Market

Notes for a Discussion with the IESO Advisory Committee

January 2006



Electricity suppliers and consumers will manage their forward price and supply risks by contracting between one another

Consumers who are unable or disinclined to manage their price risks (default load) will have their forward risks actively managed on their behalf in a way that will not preclude retail competition

Why not central-planning and long-term RFPs forever?

- Inhibits customer choice – need exit fees
- Investment risks shifted to the public for long periods of time
- Innovation is inhibited

Central planning has a track record of being conservative:

- Obligation to serve creates risks of over-contracting
- Centrally-procured supply contracts can discourage innovation

- Ability to create forward pricing curves
 - Stability in government policy
 - Stability in pricing basis – real-time/day-ahead
 - Unaffected by market power
- Simple forward contracting mechanisms; e.g.
 - Standard forward contracts and exchange
 - Day ahead market
 - Integrated prudentials?
- Ability to ensure reliability (reliability contracts, or capacity payments?, reliable dispatch)

- The IESO is committed to working with stakeholders to evolve the Ontario electricity marketplace towards a future in which competitive market forces create a suite of transparent signals that influence decisions regarding the consumption and supply of electricity in the province.
- Forward contracting between individual consumers (or their agents) and suppliers will become the dominant force in rationalizing investment in new supply. For this to occur, the following conditions must exist:
 - The majority of prospective suppliers must accept investment risks without security of long-term contracts.
 - Forward contracts between suppliers and consumers will mitigate a portion of investment risks.
 - All consumers in the province must be able to enter into forward contracts, either directly, or by an agent on their behalf.
 - Prudent risk management decisions must be made by all loads in the province i.e. Load Serving responsibilities must exist for all load, whether self-provided, or via a Load Serving Entity.
 - Any barriers to forward contracting should be eliminated. E.g.: - transparent forward price discovery - development of standard forward contracts - public trading through an exchange – rationalized prudential requirements between forward contracts and real-time market, etc.
 - Stable government and regulatory policies should provide a foundation for investment in new supply, without direct government support.
- Forward contracts and prudent demand response can potentially ensure adequate planning capacity reserve margins, but to mitigate the risk of any shortfall, a market mechanism should be developed to incent adequate reserve margins
- Forward contracts must be “tradeable”. They must converge to a commodity price that is transparent and reflective of actual supply/demand balances. A Day-Ahead Market must be developed that facilitates this interaction between the forward world of contracting and the reliability-based world of operations. The Day-Ahead and Real-Time Markets will work together to provide the critical signals that will allow consumers and suppliers the information to be able to establish contracts and forward positions that account for any physical limitations that may occur as a result of either locational or operational constraints.
- Both generators and loads will be able to supply the ancillary services needed to ensure a reliable supply of electricity to Ontario. E.G. capacity reserve margins, operating reserve, load following, regulation, etc.

- Ontario's commitment to competitive electricity markets began with the 1997 White Paper, *Direction for Change*, and the passage of the *Electricity Act* (Bill 35) in June 1999.
- The Ontario market opened on May 1, 2002, but retail prices were frozen later that year in response to consumer concerns about price increases and volatility; the market thus became a wholesale market only. Following the report of the Electricity Conservation and Supply Task Force, the Ontario government established a Hybrid Model in December 2004. Key features of the Hybrid Model include OPA contracting for supply, integrated system planning, and regulated prices for much of Ontario's generation and load.
- As Ontario's supply situation improves, it is expected that elements of the Hybrid Model will gradually be modified or replaced, and that a more classically competitive market will emerge. An important early step is to define a stable, realistic "end state" for the Ontario electricity sector, in which the role of the market is fully realized and the need for regulated prices and investment supports is minimized.
- The IESO and OPA (and the OEB) need to work with stakeholders (including the government) to articulate a clearer vision of the end state, and to sketch the main steps on the evolutionary path. A clearer vision is needed at this time to establish an appropriate context for moving forward with specific market development initiatives. Other electricity markets are going through similar re-visioning exercises and transitions, or have already done so, and Ontario can learn from their efforts and experience.

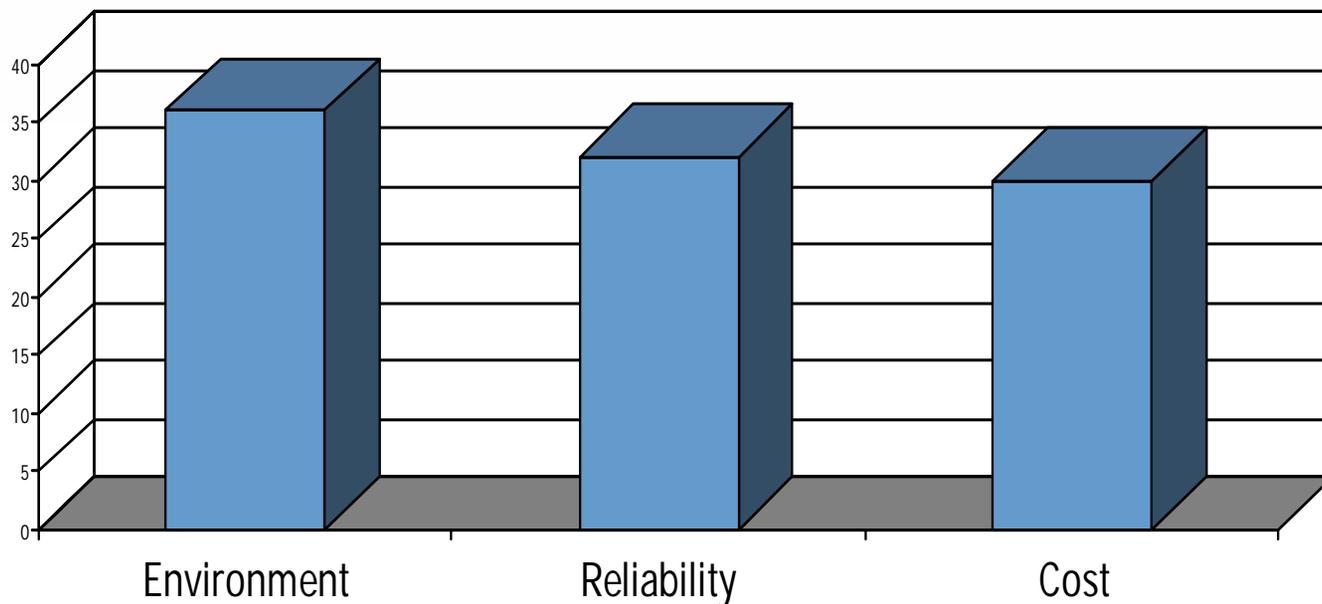
The Goals of Restructuring

The goals of the 1999 restructuring initiative were:

- More rational investment decisions, to be achieved by shifting investment risk from consumers and taxpayers to private sector investors responding to market signals
- Lowest cost dispatch of resources, to be achieved through competitive bidding
- Lowest possible prices for consumers, and more specifically, prices for industrial consumers that are competitive with those in neighbouring U.S. states
- A more reliable electricity system, to be achieved through better investment decisions and expanded trade with neighbours
- More choice for consumers, as marketers offer them alternative pricing packages and a range of new energy saving products
- More environmentally acceptable outcomes, to be achieved through green power marketing and emission trading credits
- Jobs, by facilitating more energy sector investment and keeping energy prices as low as possible
- Protection for consumers, through education, market surveillance, regulatory oversight and a right to continue to receive “default supply” from their traditional utility.

- The goals remain broadly the same as they were in 1999, but there is an additional emphasis today on adequacy, renewables and conservation.
- On a goal-by-goal basis, performance has been mixed. Restructuring has clearly not achieved the intended objectives with regard to investment, and, prior to the recent renewables contracts, there was little progress on environmental matters. There have been relatively good results in dispatch achieving improved efficiency and reliability.
- While the government continues to see an important role for competitive markets in the future electricity system, the ball is in the court of market proponents to show how markets can do a better job of delivering the goods in the future.

- The Ontario public appears to be very divided when it comes to priorities for the electricity sector. According to a Sun Media/Leger poll taken in mid October 2005, 36% of Ontarians believe that protecting the environment is most important, 32% believe that stability and reliability are most important, and 30% believe that lowest cost is most important. This implies there will be difficult, high level policy trade-offs that will impact market evolution.



- Central planning of the past failed: too many big mistakes, too much interference, too much inefficiency, too much debt. In the long run, decentralized decision-making and market co-ordination are the means by which the policy objectives will best be met.
- The IESO is committed to working with stakeholders to evolve the Ontario electricity marketplace towards a future in which competitive market forces create a suite of transparent signals that influence decisions regarding the consumption and supply of electricity in the province.
- In the end state, market signals will be the principal determinant of decisions throughout the sector, from longer term investment decisions, through mid term conservation and equipment maintenance decisions, to minute to minute decisions supporting the achievement of supply and demand balance in real time.
- The latter part of this presentation reviews the key decisions that will be needed in building from the current Hybrid Model to such an end state.

- The Market Design Committee (MDC), 1998, was tasked with developing a “high level design” for the market, and an initial set of Market Rules. It adopted the following “market design principles” to guide its work:
 - Efficiency
 - Fairness
 - Reliability
 - Transparency
 - Robustness
 - Enforceability
- The IMO Board of Directors endorsed these principles, and augmented them by adding a seventh principle, “practicality and implementability”, to highlight the idea of cost-effectiveness.
- All seven principles remain appropriate for evaluating the state of the current market, testing the emerging end state design, and assessing the changes that will be needed year by year as Ontario transitions out of the Hybrid Model toward a more market based electricity system.

- Ontario's initial model envisioned that merchant generators, responding to market prices, would deliver the right amount of new generation, in the right places, at the right time. It assumed the emergence of forward markets and trading, the eventual introduction of locational marginal prices, and the willingness of generators and their financiers to take significant risks. And, since generation reserve levels in this model are essentially a function of market decisions, it also assumed a willingness on the part of reliability authorities and governments to ride through periods of tight supply and high prices (i.e. no politically-dictated price caps).
- The model also envisioned that most transmission investment would be done on a merchant basis, relying on locational price signals and the user-pays principle of cost recovery.
- The model emphasized the importance of competitive structure, with particular focus on the supply side. Ontario's plan included short and long term targets for reducing OPG's market dominance, under a formal Market Power Mitigation Agreement.
- Another principal assumption was that a successful and growing retailing sector would emerge, and that the proportion of load on default supply would gradually decline.
- With a few exceptions, Ontario was following the "blue-print" that later became established in the U.S. as FERC's "Standard Market Design". In a broad sense, Ontario, New York, New England and PJM were all on the same path.
- Some experts thought that, in the very long run, most inter-market "seams" would be resolved, and the whole NE would function as essentially one large market.

- The pure market model is based on a number of assumptions about behaviour and price elasticity. From the beginning, there have been doubts about whether the pure model would be allowed to operate freely to attract investment, because it can potentially involve periods of uncomfortably low reserves, from a reliability perspective, and volatile prices. There have also been doubts about whether large consumers can be sufficiently price elastic to make the market work well, and whether residential consumers will have enough incentive to address their price risks on their own, by signing up with marketers and supporting robust retail competition.
- In Ontario, market opening coincided with a deteriorating supply-demand balance. There had been no major generation investment in over a decade, and nuclear generation that was expected to return to service by the time of market opening did not materialize. Merchant investment in the electricity sector had dried up throughout North America following the California market implosion, the Enron debacle, and the stock market collapse. Sharply rising gas prices were changing competitive fundamentals. There was uncertainty around Ontario's plans for its nuclear sector and its commitment to the market. Finally, there was a commitment to replace all of Ontario's coal-fired generation, about one quarter of the province's total generation capacity. It could be said that the pure market approach on investment failed; alternatively, it could be said that, in the face of overwhelming circumstances, it just did not have a fair test.
- The Ontario market opened in May 2002, but the fire-storm that erupted over consumer rates in the fall led to Bill 210, which froze retail prices retroactively to market opening levels, and more-or-less ended retail competition. The frozen price was too low. It drove away marketers and sent the wrong message with regard to conservation. The frozen price was subsequently replaced by the Regulated Price Plan that exists today, but which also reduces any incentive for forward contracting on behalf of price-taking retail loads. These developments leave us with the challenge of somehow getting the default load back into the market.
- In short, the initial model stumbled due to unrealistic assumptions, overwhelming circumstances, and an unwillingness to live with the market's short term outcomes.

The Hybrid Model was launched with the passage of the *Electricity Restructuring Act 2004* in December 2004. The key elements of the Model are:

- Establishment of the Ontario Power Authority, and new/revised roles for the IESO and OEB
- OPA responsible for ensuring long term adequacy and reliability, through contracting as and when necessary
- OPA develops long term integrated system plan for generation, transmission and conservation
- OPA advises government on appropriate generation mix, recognizing existing government targets for renewables and conservation
- Regulated prices for OPG “prescribed” assets (average of about 4.5 cents per kWh on 40% of Ontario generation), to be reset by OEB in 2008.
- Revenue cap on most other OPG assets until April 2006 (4.7 cents per kWh on about 26% of generation).
- OEB administers Regulated Price Plan for residential, other small volume, and “designated customers” who don’t choose a retailer. Consists of two-tier pricing, plus smart meter pricing. Rates recover full costs, based on annual projection of regulated, contract and spot market prices.
- Beginning April 2008, eligibility for the RPP will be limited to residential customers and general service customers under 50 kW. Municipalities, universities, schools and hospitals will no longer be eligible.

Key Differences: Initial vs Hybrid

	The Initial Model	The Hybrid Model
Generation Investment	Private sector investment in response to market prices, including locational prices.	Ontario Power Authority procures investment, providing long term risk mitigation through legislated call on the rate base. Intended to be transitional.
Transmission Investment	Merchant based. Locational prices. User-pay principle.	Integrated System Planning implies a public good approach – possibly including trunk system built “ahead of generation” and paid for by all consumers.
Planning	Minimal or non-existent central planning. Co-ordination occurs via market signals.	Long term forecasts, and high level long-term planning of generation, transmission and demand management.
Default Price	Equals spot price, averaged over the billing period (“spot price pass-through”).	OEB determined, based on the forecast blended cost of power and any previous period variance.
Supply Side Market Structure	Clear plan to reduce OPG market dominance in both peaking and base load	No explicit targets, other than coal retirement.
Possible “Add on”	Short term capacity market	Discussions about auction to set default price and replace OPA contracting with private contracting

Market-Positive	Market-Negative
<p>The OPA has publicly defined its investment role as transitional, stating that it's activities will be substantially wound down by 2015, and that it will play, at most, only a passive, backstop role thereafter.</p>	<p>Many significant activities completed or underway (Bruce, Early Movers, Manitoba, etc). There is a risk that investors will become "addicted" to the kind of support the OPA currently provides, making a return to any merchant investment model impossible.</p>
<p>The revenue cap on OPG's non-prescribed assets expires effective April 2006.</p>	<p>Revenue caps could be extended.</p>
<p>The number of end use consumers exposed to the market is growing. The MUSH sector will cease being eligible for the Regulated Price Plan, effective April 2008, and will have to start adjusting their consumption in response to the spot price, or hedge via retailers.</p>	<p>There will be pressures for the government to grant some new type of regulated price, in part because of increased price volatility post Hurricane Katrina.</p>
<p>Large volume consumers who do not currently have interval meters are required to install them. (Phase I of smart meter initiative).</p>	<p>It may take time before these consumers begin to respond meaningfully to price signals, due to need for education about markets and need to re-organize operations to become more price elastic.</p>

The Current Situation (cont)

Market-Positive	Market-Negative
OPG's market share is declining as renewable generation is added and as the off-coal initiative proceeds.	The government continues to look to OPG for significant non-nuclear investments, such as the Beck project. Also called on re Northern generation, small hydro, possible new nuclear.
The market price is applied to over half of Ontario's energy consumption.	The Global Adjustment makes it difficult for most wholesale customers to assess their actual risks.
Final consumers will all have smart meters within 5 years. (Phase II)	Risk that residential consumers are not motivated to use their new meters effectively, thereby eroding public support.
Small but growing list of large consumers who are responding to the hourly price.	In aggregate, load remains inelastic over the "normal" price range, and this makes for a one-sided market where price tends to be determined by the supply side.
A strong majority of market participants want the market to succeed, and the government sees an appropriate role for a competitive market in the long run.	Momentum to markets in the U.S. has flattened, especially retail markets.

Issue 1: Addressing Generator Development Risk Mitigation

- The initial market vision assumed that merchant generators would respond to price signals and make investments without guarantees from the market or taxpayers. Currently, in Ontario and elsewhere, the pendulum has swung to the opposite extreme, and generators and their financiers are demanding 15-20 year buy commitments, or other guarantees, before they will build new plants. We need to reverse this shift in the perceived risk of generation investment.
- It is unlikely that electricity markets will ever return to the pure merchant model. We must create the conditions for a middle ground i.e. build on-ramps to the market that facilitate private contracting and allow the OPA to reduce its role in securing new generation.
- There are three major, linked steps that need to be taken to support private contracting:
 - First, it is necessary to “organize” all default load (RPP and other price-taking customers) so it is represented in the market, and able to prudently contract forward with generators for up to, say, five years worth of supply. The widely held opinion on how to do this is through the creation of Load Serving Entities.
 - Second, it is necessary to support the development of a forward price curve. This will require a well-designed day ahead market and a potential forwards Exchange on which standard forward contracts can be publicly traded.
 - Third, it is necessary to ensure there are enough buyers and sellers to make the forward markets workably competitive.

Issue 2: Assuring Resource Adequacy

- In the old utility model, reserve margins were set (e.g. 18%), based on loss of load probability studies, taking into account the performance characteristics of the diverse generation fleet.
- In the pure competitive model, margins are a result of market decisions about how much idle capacity it is profitable to carry. There is no formal margin, per se. The result may be greater efficiency, i.e. lower reserve costs for consumers, but higher risks of load loss and potential price instability as the system swings between investment booms and busts.
- In an end state where Ontario has transitioned from OPA procurement to a world of private contracting, will the contracting assure a level of investment that delivers an appropriate reserve margin? One concern is that large portions of the load are not able or sufficiently incented to contract forward. A second concern is that generators have various ways to mitigate their contract risks and may not choose to address their risk by building reserve to the extent that the IESO and market were counting on.
- Capacity markets are in use in other jurisdictions to address the possibility of a shortfall in contracted generation and ensure that adequate reserve margins are achieved. Capacity markets can be set up in different ways. IESO staff have researched capacity markets models, but the structure of such markets is still evolving. The product needs to be carefully designed, to ensure that resulting incentives are appropriate, and guard against creating either real or perceived inappropriate wealth transfer, e.g. should a capacity market cover all capacity, or just buy the reserve margin?
- The IESO needs to design and implement a resource adequacy mechanism, to ensure continued reliable supply during a smooth transition from centralized capacity procurement through the OPA to decentralized procurement based on market signals and private contracting.

Issue 3. The Challenge of Load Serving Entities

- In order for contracting to work – and also for resource adequacy mechanisms to work – all load should be organized and participating in the process. We need to create Load Serving Entities to perform this function, for the RPP load and other price-taking customers. Again, there are various models.
- One approach is to establish LSEs with geographic franchises, usually corresponding to LDC boundaries. Despite the LDC amalgamations of recent years, there are still too many distributors to make this approach work, unless they are legislatively forced into consortia. More importantly, however, it has been considered inappropriate for local ratepayers and taxpayers to shoulder the risks involved in power procurement; the risk should be off-loaded to the private sector, or remain at the provincial level, or some combination, but not be down-loaded to local sectors. To do so would represent a significant departure in Ontario, with potentially differing electricity prices across franchise areas.
- A second approach is the financial model of LSEs, in which entities purchase strips of the default load and then procure generation to match. Those entities actively manage the OPA's risks relating to procurement for the Regulated Price Plan. One difficulty is that the LSEs in this model do not have a direct relationship with customers, and explaining the benefits may be difficult as it involves understanding the role of LSEs and the market arrangements generally.

Issue 4. The Day Ahead Market in Ontario

- The Day Ahead Market will serve as the integration point between the world of forward trading and the reliability-based operation of the system. As such, it should provide the critical signals that will allow consumers and suppliers to establish hedges that account for any physical limitations that may occur as a result of either location or operational constraints. Ensuring participation of default load may be an issue.
- There would be significant benefits from the introduction of a Day Ahead Market. Most importantly, from a market evolution perspective, traders would have a “cleaner” price on which to ground the forward price curve, thus assisting in the resolution of the investment challenge.
- Other benefits are that the IESO would have earlier information, improving reliability; inter-tie trading would be facilitated, since Ontario's U.S. neighbours operate a day ahead market; and co-ordination between the electricity and gas markets would improve.
- Ontario's 2004 DAM initiative did not go ahead. It was perceived as reliant on high participation, and as too complex and expensive (in part because it had to build around the requirement of a uniform Ontario price; other markets have locational pricing). The current plan to improve the day ahead commitment process addresses many of the industry's reliability-related needs, leaving the needs of traders and investors to be addressed through forthcoming initiatives.
- The Day Ahead Market is a tangible, first order piece of business in terms of solving the investment challenge.

- Most market participants say they remain committed to an expanded and improved competitive market as the target end state, but the specifics of the end-state need to be clarified, taking account of recent developments in Ontario and other electricity markets.
- There is a loose consensus among market participants and market design experts that Ontario needs to progress to a point where:
 - The OPA will be largely out of the revenue support business
 - Significant forward trading of electricity occurs, preferably on an Exchange
 - A day ahead market is functioning
 - The supply side of the market is more competitive than it is today
 - All consumers, large and small, are more responsive to price
 - More consumers have contracts with competitive retailers
 - Residential consumers are using their smart meters to reduce and time-shift their demand.
- These are seen to be the essential building blocks of an emerging, post-Hybrid Vision for the end state.

Requirements for a Market Vision

The Vision for the future Ontario electricity market must:

- Fit within the government's public policy framework, while being robust enough to provide stability to the market as ministers and governments change.
- Be co-ordinated across the IESO, OPA and OEB, while recognizing the unique roles and responsibilities of each.
- Be responsive to what market participants want.
- Be credible in acknowledging and dealing with the constraints and issues affecting market evolution.
- Be realistic in terms of the expectations created, especially re timing and costs.
- Be "fruitful", in the sense that it constructively guides the on-going development of the Market Rules, and the roles of the regulatory agencies; and, finally,
- Explain how, in the future, the competitive market is going to do a better job than it did in the first phase of restructuring in meeting the government's policy objectives for the sector.