



# Decarbonisation and Tomorrow's Electricity Market

**PRESENTED AT**

2017 IESO Stakeholder Summit

**PRESENTED BY**

Kathleen Spees

Co-Authors

Johannes P. Pfeifenberger

Roger Lueken

June 12, 2017

THE **Brattle** GROUP

## Decarbonisation and Market Reforms

---

- Ontario is far ahead of many other electricity markets in that it has already achieved 80% decarbonisation over the past decade
- However, the current market design is far behind
- Introduction of Cap and Trade and Market Renewal:
  - Represent a major shift away from planning/contracting approaches and toward best-in-class market design
  - Market Renewal is likely to achieve \$2,200–\$5,200 million in net efficiency benefits over the first decade
- But there is a significant outstanding question about the scope of market reforms:

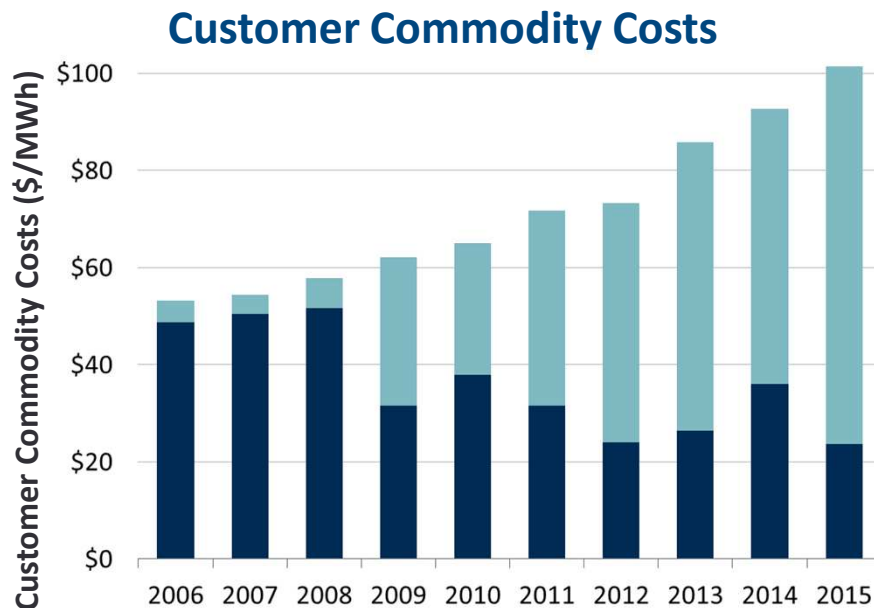
**Does Ontario need any additional clean energy policies/markets in the electricity sector beyond Cap and Trade? If so, what?**

*Sources and Notes:*

See Market Renewal Benefits Case Report: <http://www.brattle.com/system/publications/pdfs/000/005/427/original/Benefits-Case-Assessment-Market-Renewal-Project-Clean-20170420.pdf?1493049510>

## Decarbonisation Means a Shift in Cost Drivers

The new decarbonised fleet has higher investment costs and lower variable costs than the fossil-based fleet from a decade ago. Drives the increasing share of customer costs and supplier revenues from Global Adjustment



### Global Adjustment

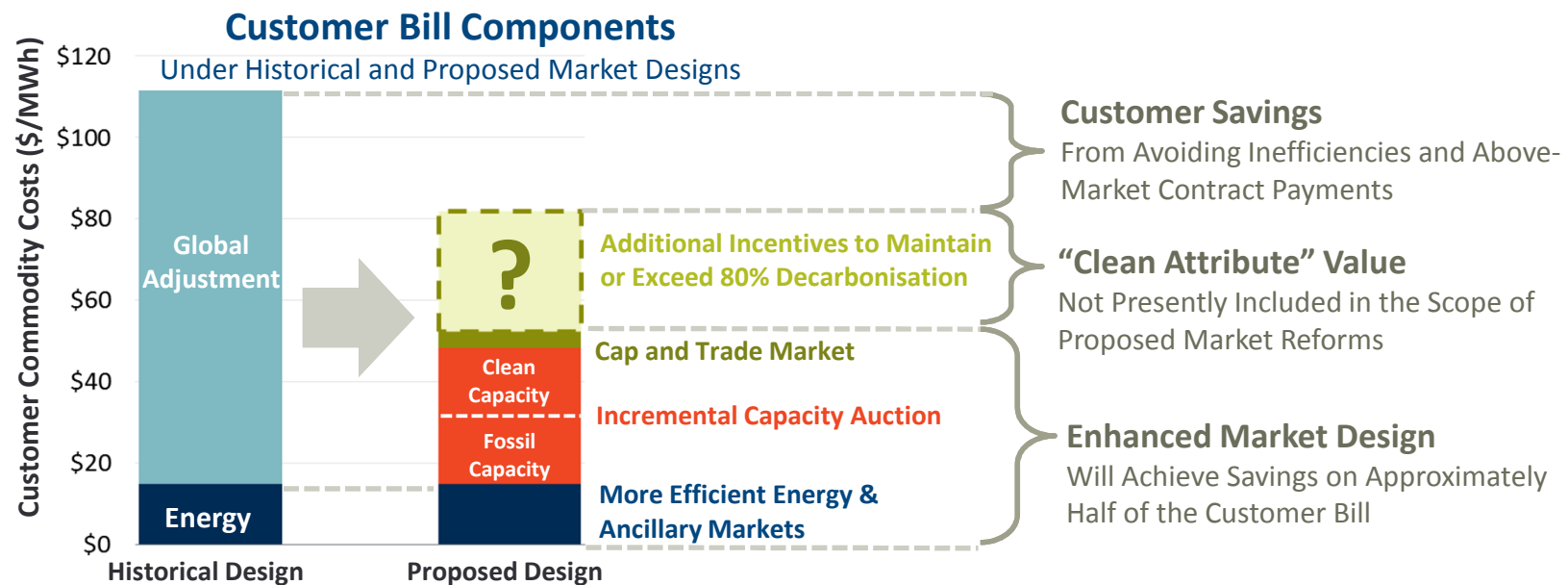
- ↑ Capacity value
- ↑ Investment costs of clean energy resources

### Energy Prices

- ↓ Lower natural gas prices
- ↓ Impact of clean energy with low or no variable cost

# How Costs Map into the Proposed Market Design

Ontario stands to achieve large efficiency benefits and customer savings through ongoing market reforms. But a significant share of system/customer costs are associated with “clean” value not covered in proposed market scope



Sources and Notes: Left: 2016 realized Global Adjustment and HOEP. Right: Indicative calculation at \$18/tonne CO<sub>2</sub>e price, and assuming capacity prices at approximate CT Net CONE paid to all capacity resources.

# Options for Expressing Electricity Sector CO<sub>2</sub>e Objectives

Ontario could choose one of three primary “paths” forward for expressing CO<sub>2</sub>e objectives in the electricity sector:

## Rely Solely on Economy-Wide Cap and Trade

- Rely only on new Cap and Trade market to achieve economy-wide least-cost CO<sub>2</sub>e reductions
- Phase out sector-specific incentives & contracts
- Expect that electricity sector CO<sub>2</sub>e emissions will increase (*e.g.*, during nuclear refurbishments)

## Future Supply Contracts for Clean Energy

In Addition to Cap and Trade

- Continue prior contracting approaches for clean energy
- Maintain associated inefficiencies
- Attempt to manage regulatory risks and impacts on energy & capacity markets

## Market-Based Solution for the Electricity Sector

In Addition to Cap and Trade

- Define sector-specific CO<sub>2</sub>e (or clean MWh) objectives
- Design a market solution such as: (1) enhanced CO<sub>2</sub>e pricing (above economy-wide prices), or (2) clean attribute market

## Possible Next Steps

---

- The Ministry and the IESO have expressed the intent to adopt resource-neutral, market based approaches to achieve efficiency and customer benefits
- For decarbonization, a market-based approach would mean:
  - Phasing out supply contracts (for both fossil and clean)
  - Deciding whether the economy-wide Cap and Trade market is sufficient to meet policy objectives (*i.e.*, that it will achieve least cost reductions in Ontario, though electricity sector emissions may increase)
  - If there is a need to stay decarbonized or achieve additional reductions in the electricity sector, than do so using a made-in-Ontario, market-based approach (in addition to economy-wide Cap and Trade)
- If Ontario chooses to adopt a sector-specific CO<sub>2</sub>e pricing or clean energy market, it would need to be a made-in-Ontario approach that reflects the province's unique circumstances and needs

## Presenter Information

---



### **KATHLEEN SPEES**

Principal | Boston

[Kathleen.Spees@brattle.com](mailto:Kathleen.Spees@brattle.com)

+1.617.234.5783

Dr. Kathleen Spees is a Principal at The Brattle Group with expertise in designing and analyzing wholesale electric markets and carbon policies. Dr. Spees has worked with market operators, transmission system operators, and regulators in more than a dozen jurisdictions globally to improve their market designs for capacity investments, scarcity and surplus event pricing, ancillary services, wind integration, and market seams. She has worked with U.S. and international regulators to design and evaluate policy alternatives for achieving resource adequacy, storage integration, carbon reduction, and other policy goals. For private clients, Dr. Spees provides strategic guidance, expert testimony, and analytical support in the context of regulatory proceedings, business decisions, investment due diligence, and litigation. Her work spans matters of carbon policy, environmental regulations, demand response, virtual trading, transmission rights, ancillary services, plant retirements, merchant transmission, renewables integration, hedging, and storage.

Kathleen earned a B.S. in Mechanical Engineering and Physics from Iowa State University. She earned an M.S. in Electrical and Computer Engineering and a Ph.D. in Engineering and Public Policy from Carnegie Mellon University.

The views expressed in this presentation are strictly those of the presenter and do not necessarily state or reflect the views of The Brattle Group.

# About The Brattle Group

---

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governmental agencies worldwide.

We combine in-depth industry experience and rigorous analyses to help clients answer complex economic and financial questions in litigation and regulation, develop strategies for changing markets, and make critical business decisions.

Our services to the electric power industry include:

- Climate Change Policy and Planning
- Cost of Capital
- Demand Forecasting Methodology
- Demand Response and Energy Efficiency
- Electricity Market Modeling
- Energy Asset Valuation
- Energy Contract Litigation
- Environmental Compliance
- Fuel and Power Procurement
- Incentive Regulation
- Rate Design and Cost Allocation
- Regulatory Strategy and Litigation Support
- Renewables
- Resource Planning
- Retail Access and Restructuring
- Risk Management
- Market-Based Rates
- Market Design and Competitive Analysis
- Mergers and Acquisitions
- Transmission



# Offices

