

Local Avoided Costs – Overview

For the Toronto Local Advisory Committee

September 2017

Background

- Some members of the Advisory Committee have asked for information on how the Working Group proposes to address local avoided costs in the context of a power system plan
- As the regional plan is getting underway, this presentation contains some basic information on avoided costs, how and why they are used, and some considerations for estimating local avoided costs for the Toronto plan

Some Key Messages About Avoided Costs

- System avoided costs that account for energy, capacity, transmission, distribution, and losses have been used in Ontario for many years to assess the cost-effectiveness of Conservation and Demand Management programs
 - These values are updated periodically as provincial outlook changes
- Local avoided costs depend strongly on the plan – they are plan specific, determined based on the actual timing and scope of transmission and distribution needs and least-cost wires solutions
 - It would be difficult to talk about local avoided costs now, without first establishing the future reliability needs and options for addressing those needs. It would be more productive to have this discussion on local avoided costs during the IRRP phase of the planning process

What is an “Avoided Cost”

- In the context of electricity planning, avoided costs are the savings associated with the power system *not* having to generate and deliver additional units of electricity, while still meeting the demand requirements of customers
 - Reduced need for electricity service on the supply-side can result from Conservation and/or other demand-side measures such as Distributed Energy Resources

Avoided Costs, Use and Inclusions

- Avoided costs have been used in Ontario for many years to assess the cost-effectiveness of Conservation programs
 - These avoided costs reflect the system-wide benefits of Conservation and Demand Management
- The avoided costs are updated periodically, and include:
 - Avoided generation, energy (kWh) and capacity (kW)
 - Avoided transmission and distribution capacity
 - Transmission and distribution system losses

Avoided Cost Table for Ontario – 2015-2034

The table below contains the most recent set of avoided costs for Ontario, as of September 2017.

Year	Avoided Cost of Energy Production 2014 \$/MWh by TOU Period								Avoided Capacity Costs 2014 \$/kW-yr		
	Winter			Summer			Shoulder		At System Peak		
	On-Peak	Mid-Peak	Off-Peak	On-Peak	Mid-Peak	Off-Peak	Mid-Peak	Off-Peak	Generation Capacity	Transmission	Distribution
2015	\$46.53	\$43.38	\$37.76	\$33.65	\$38.83	\$31.87	\$47.55	\$40.77	-	\$3.83	\$4.73
2016	\$36.08	\$31.88	\$31.81	\$31.39	\$36.65	\$29.55	\$42.24	\$35.94	-	\$3.83	\$4.73
2017	\$40.97	\$34.96	\$28.72	\$27.98	\$38.38	\$30.74	\$38.39	\$33.51	\$162.15	\$3.83	\$4.73
2018	\$41.97	\$35.82	\$32.69	\$25.14	\$36.66	\$29.75	\$31.77	\$26.98	\$162.15	\$3.83	\$4.73
2019	\$40.71	\$38.57	\$34.37	\$37.43	\$43.06	\$34.67	\$36.72	\$32.90	\$162.15	\$3.83	\$4.73
2020	\$39.88	\$36.86	\$34.93	\$36.75	\$41.06	\$33.80	\$33.89	\$31.23	\$162.15	\$3.83	\$4.73
2021	\$47.28	\$45.16	\$44.50	\$43.91	\$48.41	\$44.82	\$40.19	\$38.99	\$162.15	\$3.83	\$4.73
2022	\$48.33	\$47.47	\$45.76	\$42.48	\$46.39	\$43.93	\$40.97	\$39.27	\$162.15	\$3.83	\$4.73
2023	\$42.94	\$42.84	\$42.41	\$41.86	\$46.18	\$42.58	\$35.85	\$33.64	\$162.15	\$3.83	\$4.73
2024	\$43.28	\$42.02	\$40.73	\$41.90	\$46.17	\$41.61	\$34.45	\$32.84	\$162.15	\$3.83	\$4.73
2025	\$44.37	\$43.42	\$42.15	\$40.28	\$43.89	\$39.21	\$36.29	\$36.05	\$162.15	\$3.83	\$4.73
2026	\$41.26	\$40.08	\$39.69	\$39.77	\$44.01	\$38.82	\$34.52	\$32.62	\$162.15	\$3.83	\$4.73
2027	\$44.01	\$41.72	\$41.89	\$39.32	\$42.89	\$38.96	\$41.17	\$39.10	\$162.15	\$3.83	\$4.73
2028	\$43.82	\$42.88	\$40.20	\$41.56	\$45.57	\$40.75	\$36.94	\$33.86	\$162.15	\$3.83	\$4.73
2029	\$45.32	\$43.69	\$41.06	\$40.96	\$44.43	\$40.30	\$39.97	\$39.19	\$162.15	\$3.83	\$4.73
2030	\$44.18	\$43.17	\$41.25	\$42.10	\$45.83	\$39.88	\$36.33	\$34.50	\$162.15	\$3.83	\$4.73
2031	\$43.53	\$42.40	\$40.04	\$40.95	\$43.95	\$38.57	\$38.45	\$37.29	\$162.15	\$3.83	\$4.73
2032	\$41.96	\$40.90	\$39.24	\$40.56	\$43.38	\$38.15	\$36.42	\$33.61	\$162.15	\$3.83	\$4.73
2033	\$41.96	\$40.90	\$39.24	\$40.56	\$43.38	\$38.15	\$36.42	\$33.61	\$162.15	\$3.83	\$4.73
2034	\$41.96	\$40.90	\$39.24	\$40.56	\$43.38	\$38.15	\$36.42	\$33.61	\$162.15	\$3.83	\$4.73

Avoided Costs for Local Needs

- Avoided costs in use today reflect the benefits of Conservation on the province-wide grid
 - They do *not* fully account for local system needs that might be partially or fully addressed through Conservation or other demand-side measures
- A *local* avoided cost will vary based timing, geographic scale, scope of solutions, etc.
 - In contrast to a system avoided cost, there is no universal set of local avoided cost tables – a local avoided cost depends on location and timing; it may be high in one area and low to zero in another

System Wide vs. Localized Avoided Costs

- System-wide avoided cost values can be applied to Conservation virtually *anywhere* in the province, whereas, local avoided costs can only be realized if the Conservation is able to target infrastructure needs within a specific area
- Specific analysis must be undertaken for each transmission/distribution project to determine the potential localized avoided cost and deferral period for varying levels of Conservation impact

A Simplified Example – Transformer Station

Consider a transformer station supplying customers in a fast growing part of Toronto. There is a finite capability to supply the demand from the station. As the local demand grows close to the station's limit, investments must be made to supply further growth.

- *Regional Planning identifies the capacity needed to supply future growth, when it is needed, and how much it will cost if supplied through station expansion*

Other measures, such as Conservation, can reduce the demand growth in the area. These targeted measures can defer the need date for the station expansion. There is value in pushing these types of investments to a point further into the future.

- *The Present Value of deferral of the station expansion is the local avoided cost*

