MONTHLY MARKET REPORT

FEBRUARY 2019

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Table of Contents

List of Figures

This report provides a summary of key market data from the IESO-administered markets. It is intended to provide a quick reference for all market stakeholders. Any data used in this report is provided for information purposes only, and should not be used for settlement purposes. All currency data is reported in Canadian dollars ($CAD).

1 Market Prices

This section provides information on several key prices in the Ontario wholesale electricity market. A brief description of each reported price item is included. For more information on any of the price items, please refer to appropriate market rules, market manuals and training materials, or contact IESO Customer Relations.

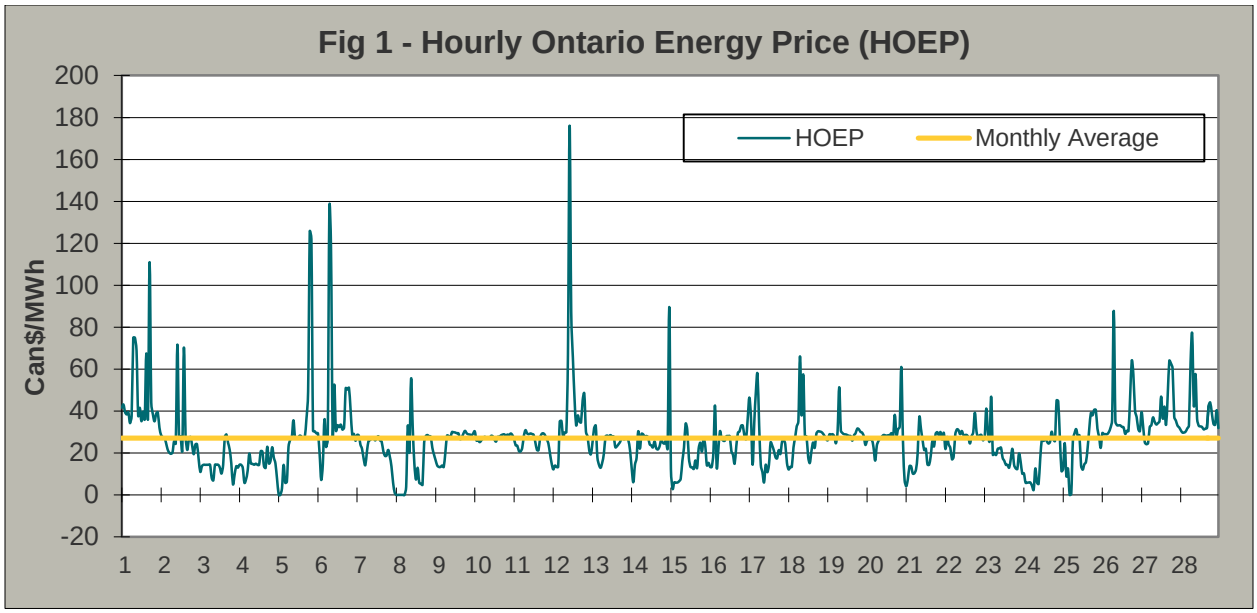
1.1 Hourly Ontario Energy Price (HOEP)

HOEP is the hourly price that is charged to Local Distribution Companies and other non-dispatchable loads. HOEP is also paid to self-scheduling generators. HOEP forms part of the commodity charge in the retail electricity market for customers who purchase their electricity from their Local Distribution Company. Customers who have arranged contracts with licensed retailers are not affected by HOEP, but instead are charged their particular contract rate for the commodity.

Note: The IESO provides a convenient graph of HOEP prices for the current and previous day on the Power Data page on the IESO Web site. These graphs also provide an estimate of projected HOEP prices for the remainder of the day, and by afternoon, estimates for the next day. The estimates for future Hourly Ontario Energy Prices are extracted from internal IESO calculations and are updated every hour. All projected prices are derived by simulating a supply/demand balance, using prices offered by suppliers in the market, prices bid by dispatchable loads in the market, and the IESO's forecast of the total demand for electricity in the province. The actual supply/demand balance can vary from these projections for a number of reasons:

- The actual demand for electricity can fluctuate as factors such as weather, (temperature, amount of cloud cover, wind etc.), affect the amount of electricity used by consumers.
- At the same time, operational difficulties, unexpected generation losses or delays in a generation unit returning from an outage can result in higher priced generation being called on to fill the gap.
- Changes in interjusdictional trade.

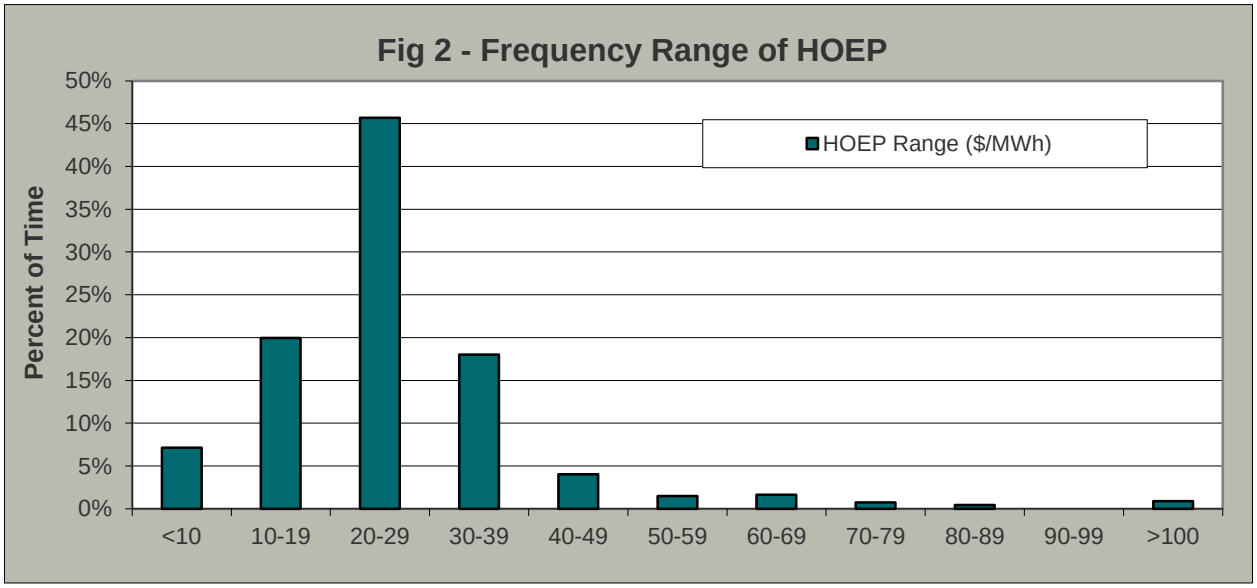
In this report, two graphs of HOEP are provided; the first shows a chronological graph of hourly HOEP prices for the month. The second graph shows the frequency at which the HOEP fell within specific price bands.



Hourly Ontario Energy Price $/MWh			
	For the month	On-Peak	Off-Peak
Average	27.08	32.56	22.55
Maximum	176.09	176.09	89.60
Minimum	0.00	4.80	0.00

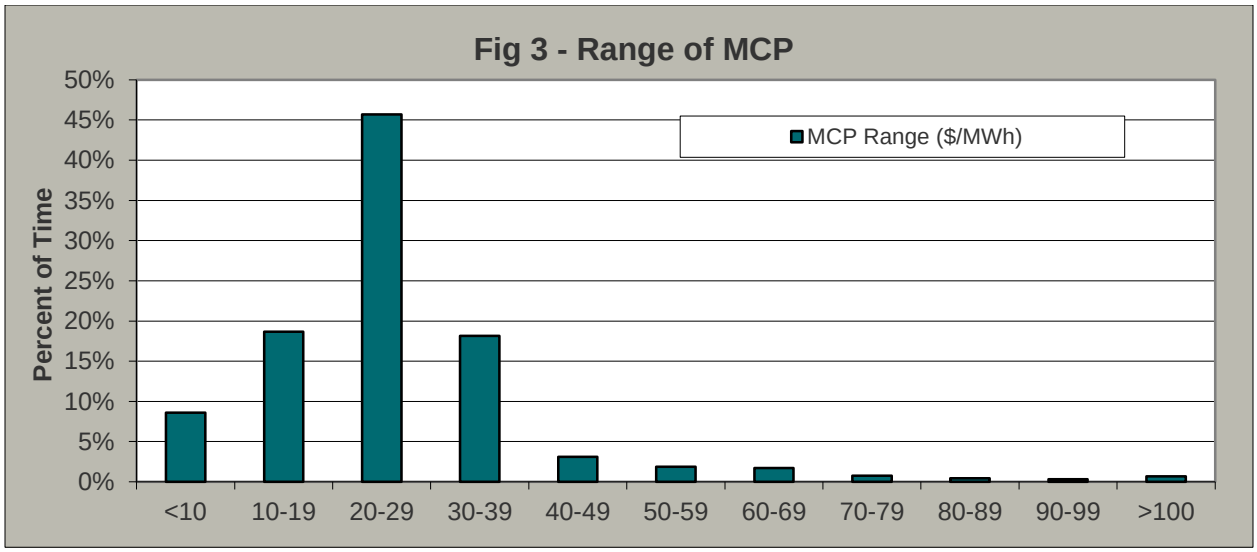
Monthly Weighted Average based on Ontario Demand = $27.89/MWh or 2.79 ¢/kWh.
This weighted average is provided as information, and may be of use to customers whose consumption pattern, or that of their local distribution company, approximates that of the total Ontario system.

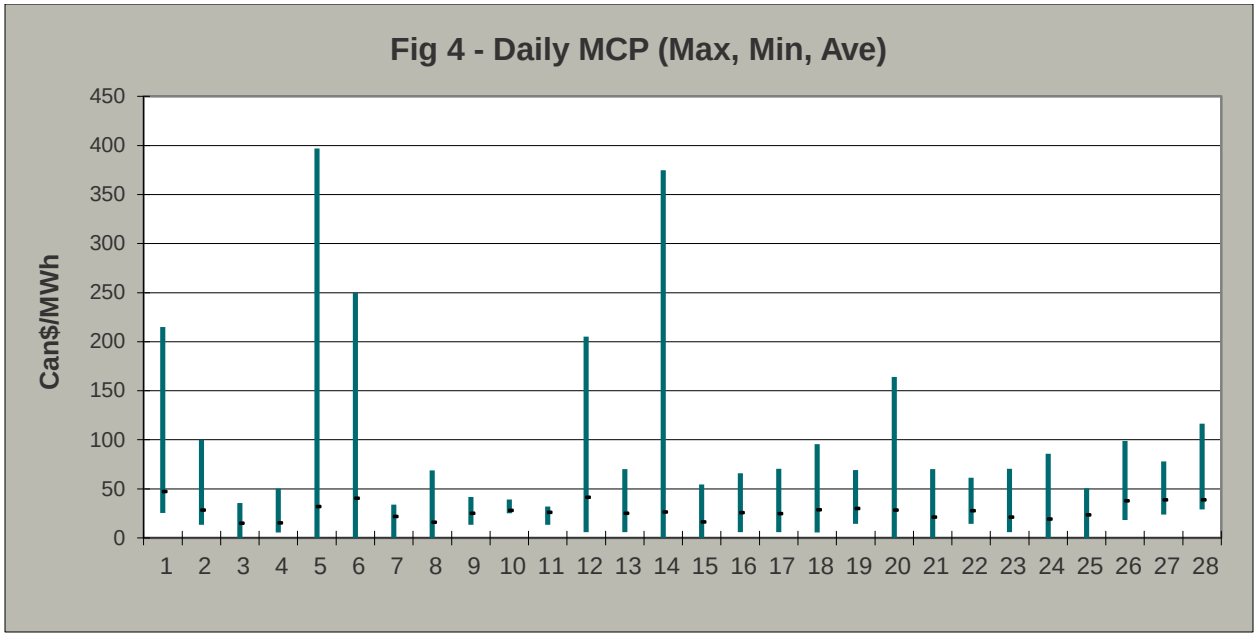
Note: On Peak average price is the straight arithmetic average of HOEP in hours 8 to 23 (EST), Monday to Friday (5 x 16). Off Peak average price is the straight arithmetic average of HOEP for all remaining hours in the week. The wholesale market does not use a formal definition of on and off-peak hours. The IESO is providing this calculation purely for information purposes, and will continue to use this definition throughout the year.



1.2 Ontario 5-Minute Market Clearing Price (MCP)

The Ontario 5-minute MCP is the price paid to dispatchable generators and charged to dispatchable loads. All other participants are charged or paid using hourly prices. The 5-minute price is calculated immediately after the fact for every 5-minute interval, using the unconstrained dispatch algorithm. The algorithm takes generator offers to sell and dispatchable load bids to buy and dispatches these resources to achieve a supply-demand balance, and resulting price. The price is posted on the Power Data page on the IESO Web site on the "Price" tab, within 5-minutes of the conclusion of an interval. The 5-minute price, by its nature, will fluctuate more than the HOEP (an arithmetic average of the 12 MCPs for any particular hour), as it more directly reflects the short-term supply/demand variations caused by unexpected fluctuations in the demand for electricity or by equipment breakdowns.



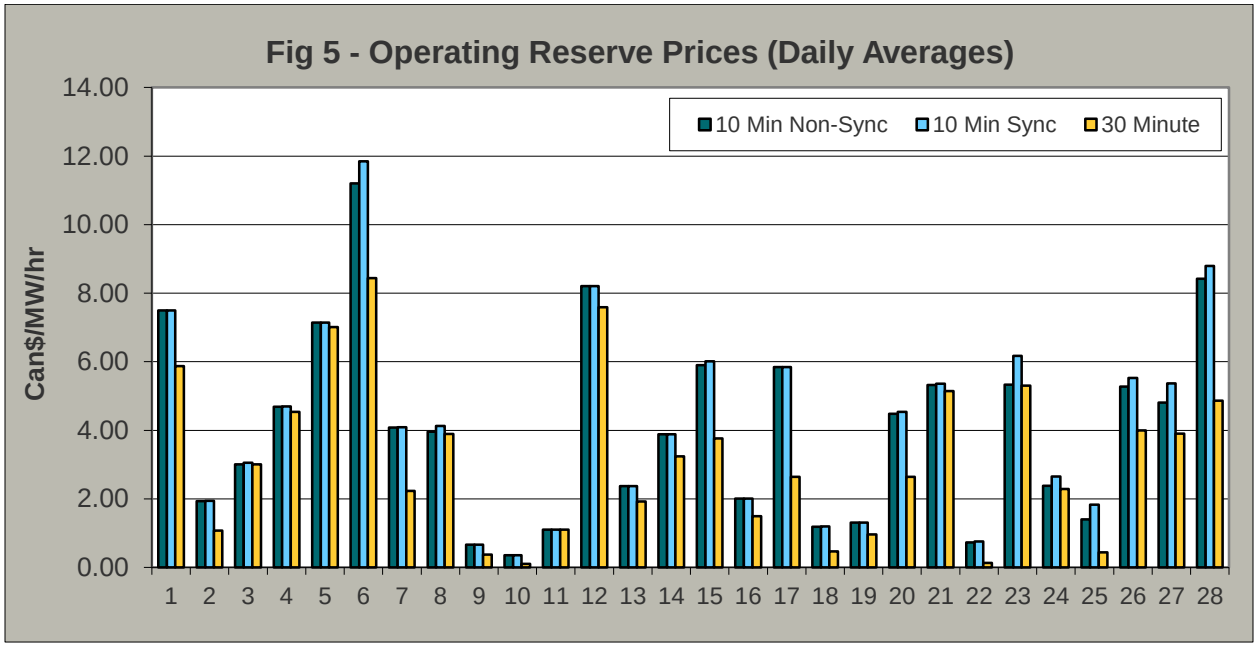


1.3 Operating Reserve Prices

Operating Reserve is stand-by power or demand reduction that can be called on with short notice to deal with an unexpected mismatch between generation and load. Operating Reserve is purchased by the IESO in amounts needed to meet the reliability rules established by the North American Electricity Reliability Council (NERC), and the Northeast Power Coordinating Council (NPCC). The IESO recovers the required funds to pay for the purchased operating reserve from all customers in the wholesale market, via Hourly Uplift Settlement Charges.

The IESO purchases defined amounts of Operating Reserve from Participants via three real-time markets: a 10-minute synchronized reserve market, a 10-minute non-synchronized reserve market, and a 30-minute reserve market.

Like energy dispatch instructions, Operating Reserve schedules are determined every 5 minutes, with a resultant price for each type of operating reserve for every 5-minute interval. The IESO's decisions on who will provide the market with operating reserve, and who will supply the market with energy, are integrated to arrive at the optimum market outcome. This creates a strong correlation between the energy price fluctuations and the fluctuations in reserve prices.



Average Operating Reserve Prices for this month were:

10-minute synchronized reserve: $4.23 / MWh
10-minute non-synchronized reserve: $4.09 / MWh
30-minute reserve: $3.16 / MWh

1.4 Transmission Rights Market

The Transmission Rights Market is a financial market that is based on the import and export of electricity on the interconnection lines between Ontario and its surrounding markets in Manitoba, Quebec, New York, Michigan and Minnesota. When the interconnection lines reach their limits, energy prices can differ between Ontario and its surrounding markets. The Transmission Rights Market allows participants to buy financial protection ahead of time, to hedge against the possible price differences. These transmission rights are financial only. They do not give the holder of these rights any scheduling priority and do not limit other participants' access to physical transmission across the interconnection lines.

The Transmission Rights contracts are auctioned off by the IESO. Successful bidders pay the market clearing price for the particular Transmission Right, in return for the right to receive revenues from the IESO in amounts proportional to the financial congestion which may occur over that interface for the duration of the contract.

Results from this month's Transmission Rights Market are below. Specific information on auctions is available on the market calendars page of the IESO website. All figures are $/MW and are rounded to the nearest dollar.

	Short Term Auction February 2019 $/MW - Round 1		Long Term Auction February 2019 $/MW - Round 1		Long Term Auction February 2019 $/MW - Round 2	
Intertie Zone	Import to Ontario	Export from Ontario	Import to Ontario	Export from Ontario	Import to Ontario	Export from Ontario
New York	2155	28	35055	69	41724	72
Michigan	3775	2	96625	78	102334	84
Minnesota			53670	2108	54900	2609
Manitoba	2842	90	38737	1362	37332	905
Quebec - AT	42	521	2525	7027	2190	8020
Quebec - D5A	0	0	10	13	11	10
Quebec - D4Z		1				
Quebec - P33C		2		15		20
Quebec - X2Y				36		5
Quebec - H4Z	38		448		250	
Quebec - B5D/B31L		37		600		888

1.5 Transmission Rights Payments

The holders of Transmission Rights Contracts own the right to receive congestion payments from the IESO whenever congestion results in differences between the Ontario price and the relevant external zone price. The table in this section shows the payments that a holder of a 1 MW Transmission Rights Contract received from the IESO in this month. These payments would be made to holders of either Long-Term Transmission Rights Contracts that encompass this month, or Short -Term Transmission Rights contracts for this month.

Intertie Zone	Import to Ontario ($ per 1 MW contract)	Export from Ontario ($ per 1 MW Contract)
Manitoba	4	1655
Michigan		1390
Minnesota	180	6088
New York		646
Quebec - B5D/B31L		
Quebec - D4Z		
Quebec - D5A		
Quebec - H4Z		
Quebec - P33C		
Quebec - X2Y		
Quebec - AT	184	

1.6 Transmission Rights Clearing Account

The table below provides the activity of the Transmission Rights Clearing Account on a monthly basis for the past 6 months. It shows the revenues from the Transmission Rights Market, congestion rents from the market, interest earned on the balance and the Transmission Rights payments to Transmission Rights holders in millions of dollars. Long-term auction revenues are allocated evenly over the applicable 12-month term and the table below does not include revenues from future months. As per Chapter 8, section 4.18 of the market rules the reserve threshold as set by the IESO Board is equal to $20 million.

	$Millions										
Transmission Rights (TR) Summary	**Previous Balance**	**Jun-18**	**Jul-18**	**Aug-18**	**Sep-18**	**Oct-18**	**Nov-18**	**Dec-18**	**Jan-19**	**Feb-19**	**LTD Total**
Allocated TR Auction Revenues	$873.4	$16.1	$11.9	$10.9	$10.1	$12.0	$12.3	$12.5	$14.0	$12.1	$985.3
Congestion Rents Received from the Market	$1,266.6	$13.3	$15.4	$6.3	$11.1	$25.5	$18.1	$9.4	$8.4	$2.5	$1,376.4
Interest earned on TR Bank Account	$7.1	$0.2	$0.1	$0.2	$0.2	$0.3	$0.4	$0.3	$0.1	$0.1	$9.0
TR Payments to Rights Holders	-$1,423.7	-$13.8	-$15.8	-$5.3	-$8.6	-$20.5	-$13.9	-$7.3	-$6.3	-$2.7	-$1,517.9
TR Clearing Account Disbursement	-$685.5	-$0.0	$0.0	$0.0	$0.0	-$0.1	-$87.3	$0.0	$0.0	$0.0	-$772.8
Total	**$37.8**	**$15.8**	**$11.6**	**$12.0**	**$12.8**	**$17.3**	**-$70.5**	**$14.9**	**$16.2**	**$12.0**	**$79.9**

2 Market Demand

2.1 Market Demand Definitions and Graphs

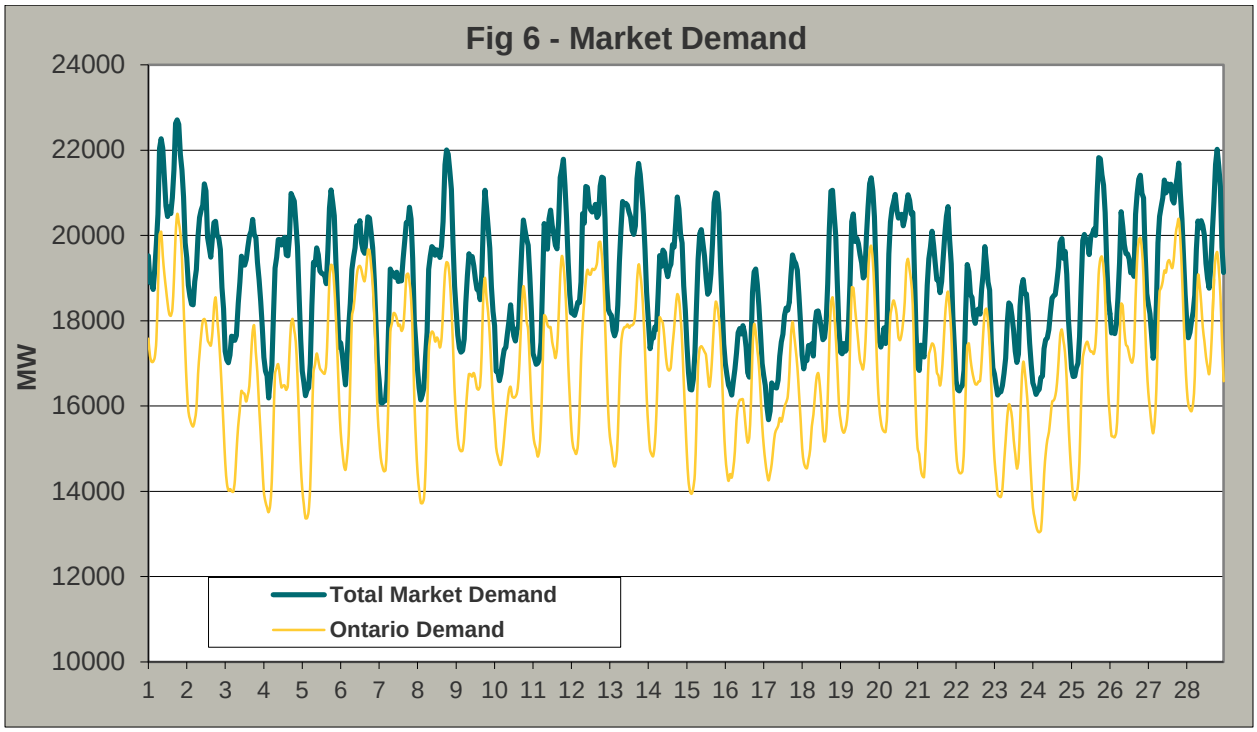
The graph below plots values for both Total Market Demand and Ontario Demand.

Total Market Demand represents the total energy that was supplied from the IESO-Administered Market.

The IESO calculates Total Market Demand by summing all output from generators registered in the Market plus all scheduled imports to the province. It is also equal to the sum of all load supplied from the Market plus exports from the province, plus all line losses incurred on the IESO-controlled grid.

Ontario Demand represents the total energy that was supplied from the IESO-Administered Market for the purpose of supplying load within Ontario.

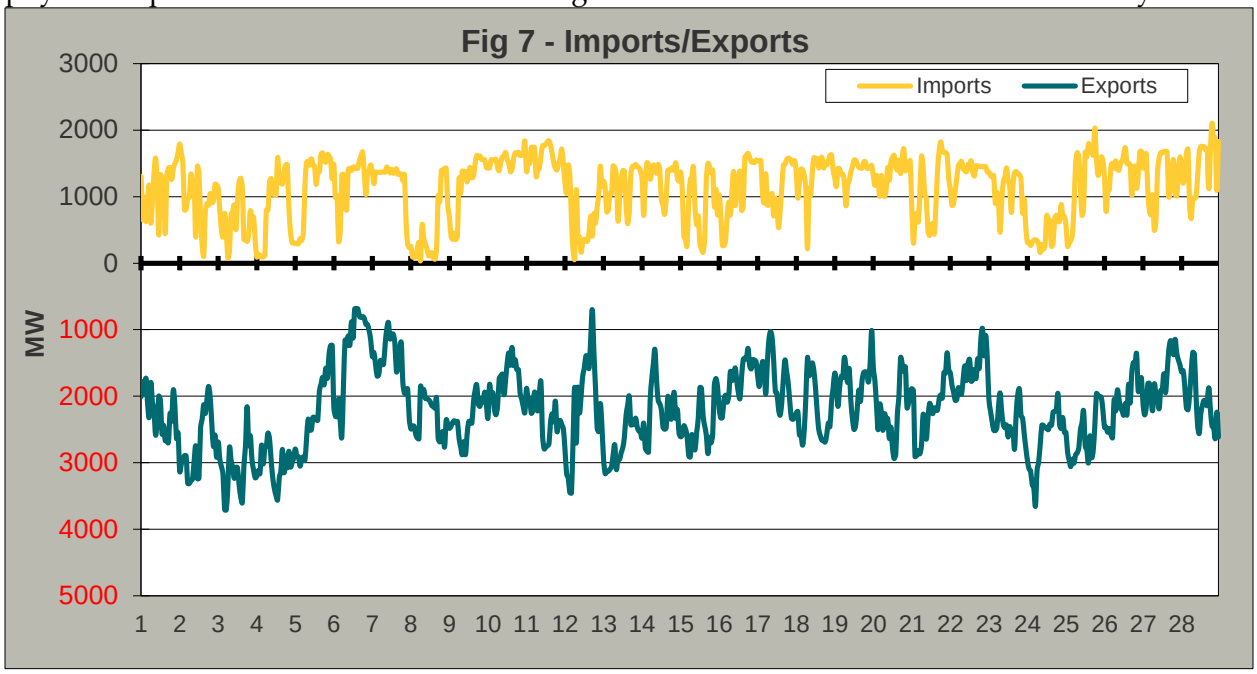
It is also equal to the sum of all loads within Ontario which is supplied from the Market, plus all line losses incurred on the IESO-controlled grid.



Demand	Total Market Demand	Ontario
Average hourly values for the month:	18,953 MW	16,803 MW
Maximum hourly values for the month:	22,707 MW	20,500 MW
Minimum hourly values for the month:	15,676 MW	13,041 MW
Total Demand for the month:	12,736,084 MWh	11,291,758 MWh

2.2 Imports & Exports

The graph below plots both imports to Ontario and exports from Ontario during the month. Economic **imports** and **exports** are scheduled into/out of Ontario on an hourly basis, up to the physical capabilities of the IESO-controlled grid and the interconnections between the systems.

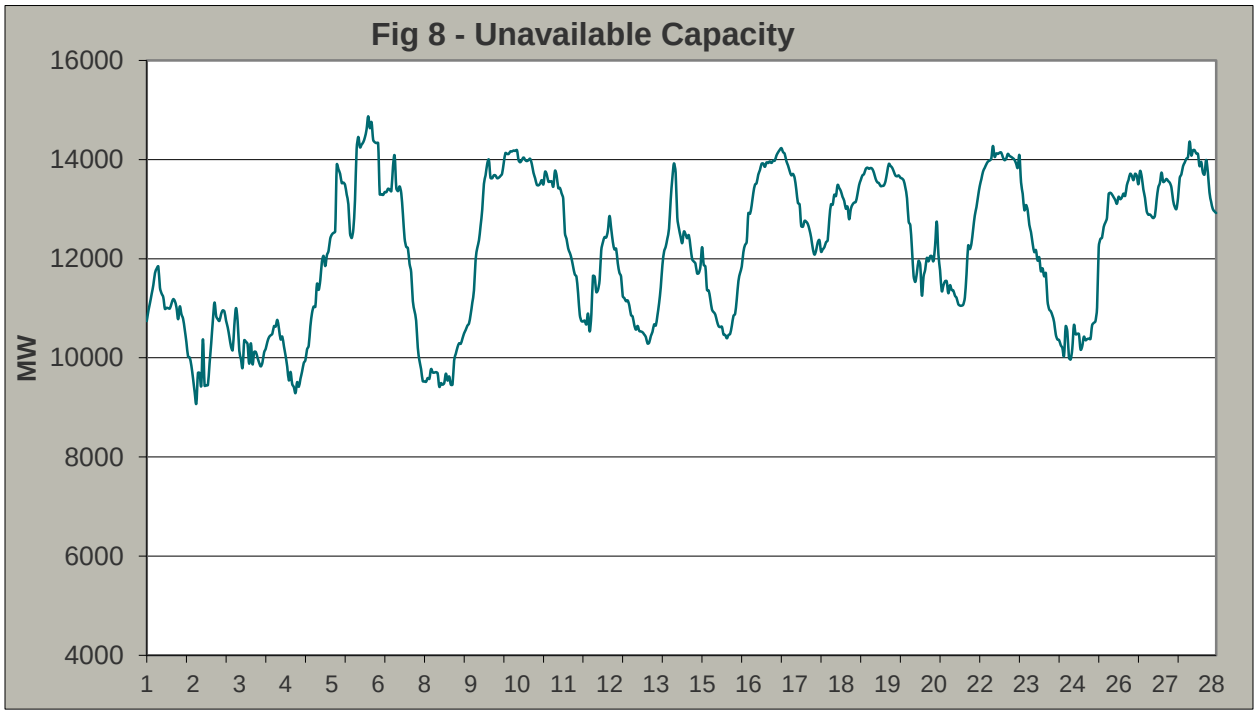


Average export schedule for the month = 2,201 MW
Average import schedule for the month = 1,141 MW
Average net intertie schedule = 1,060 MW net export

3 Unavailable Capacity

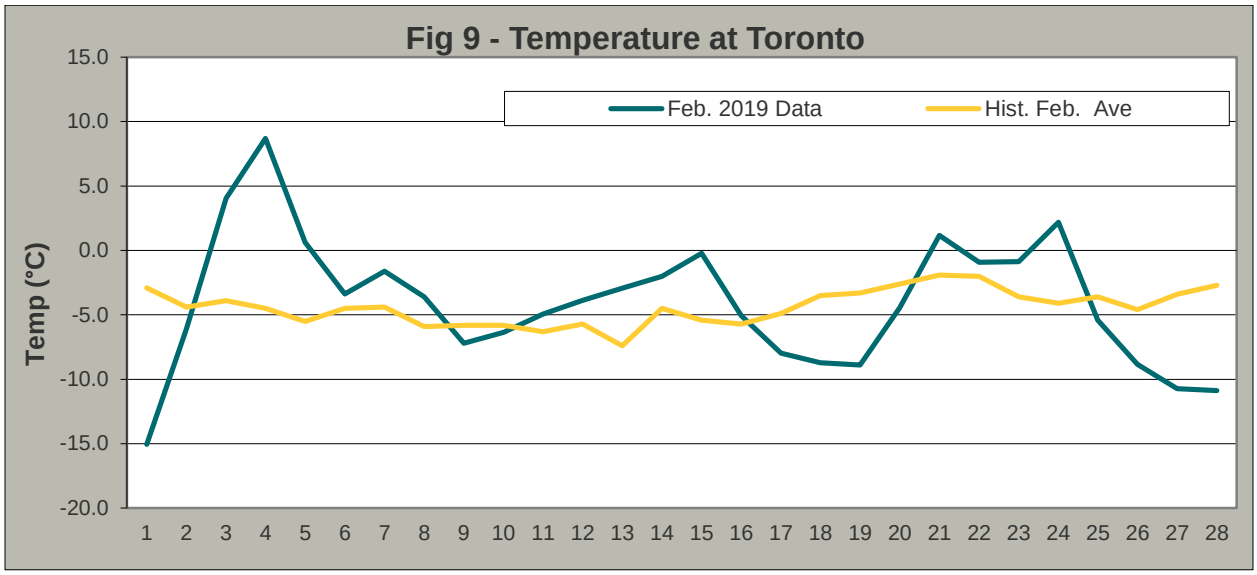
Demand for electricity varies greatly; from hour to hour, from day to day, and from season to season. The amount of generation available for operation also varies greatly over these same timeframes. This graph shows the total capability of generation within Ontario that is unavailable for operation. These quantities are published by the IESO several times per day in the Adequacy Report. The values in this graph are calculated by summing the following quantities (all in MW):

- capacity of generators on planned and forced outages
- capacity of planned and forced deratings
- unscheduled capacity from Intermittent, Self-Scheduling , and Transitional Scheduling Generators
- constrained capacity due to operating security limits and plotting the highest value for each day. The values are taken from the most up-to-date Adequacy Report at any point in time.



4 Weather

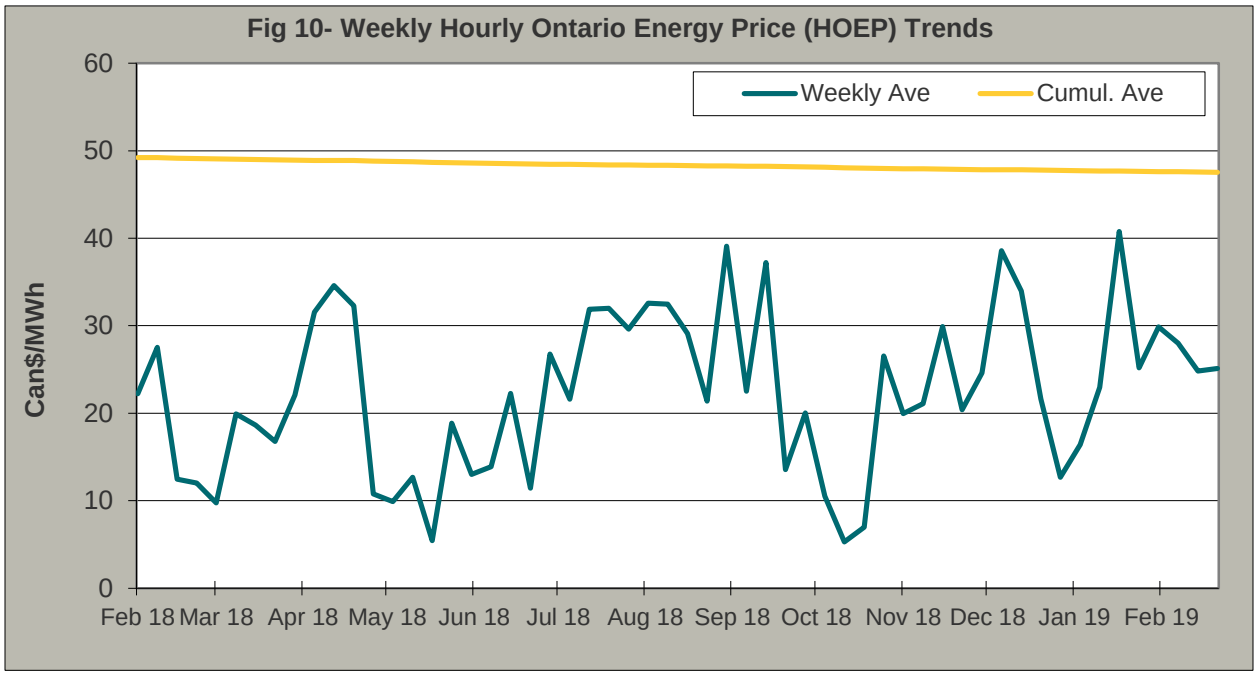
Demand for electricity is affected by weather in many ways. By far the most significant factor is temperature, with warm summer-like temperatures causing an increase in load due to air conditioning use, and cold winter temperatures resulting in additional heating load. The graph below shows the average daily temperature in Toronto throughout this month, and compares it to historic average temperatures for the corresponding days. The IESO monitors weather conditions (temperature, humidity, wind speed, illumination, storm activities) across the entire province and factors these conditions into demand forecasting and operational decisions.



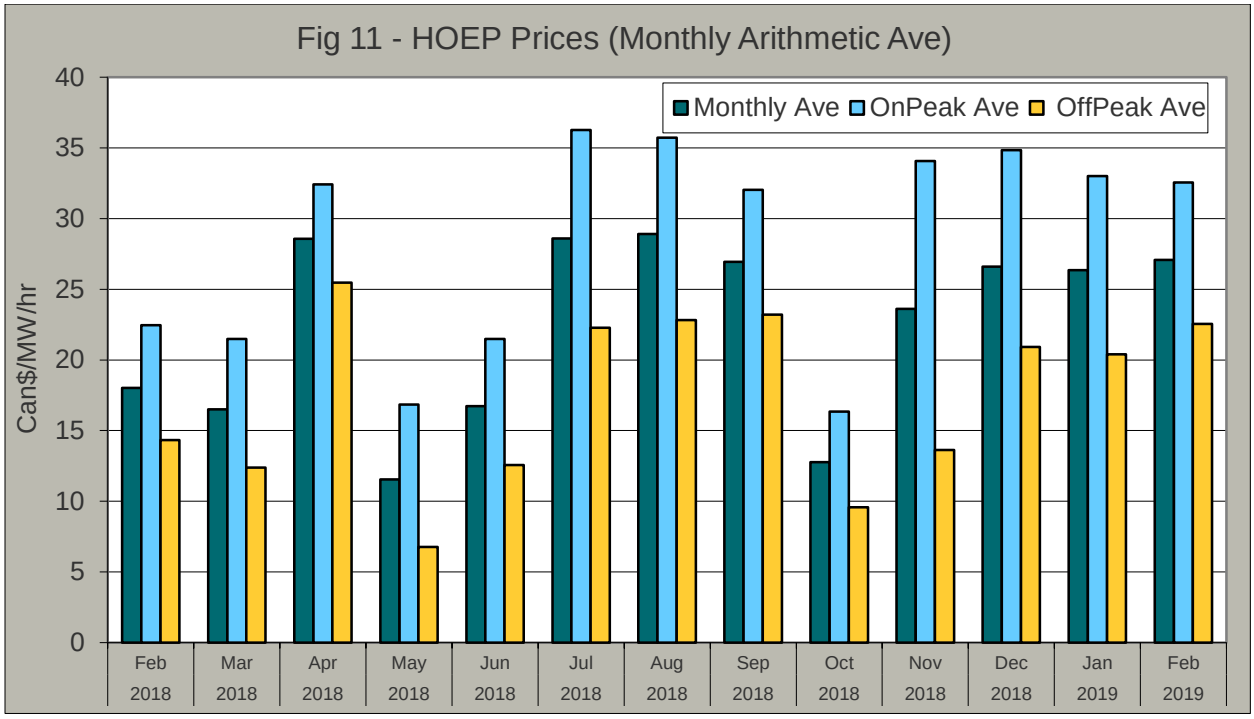
5 Longer-Term Trends

This section provides graphs that display average quantities over longer periods of time. This longer-term perspective shows seasonal variations. Additional background information on some of these graphs is available on related graphs in previous sections.

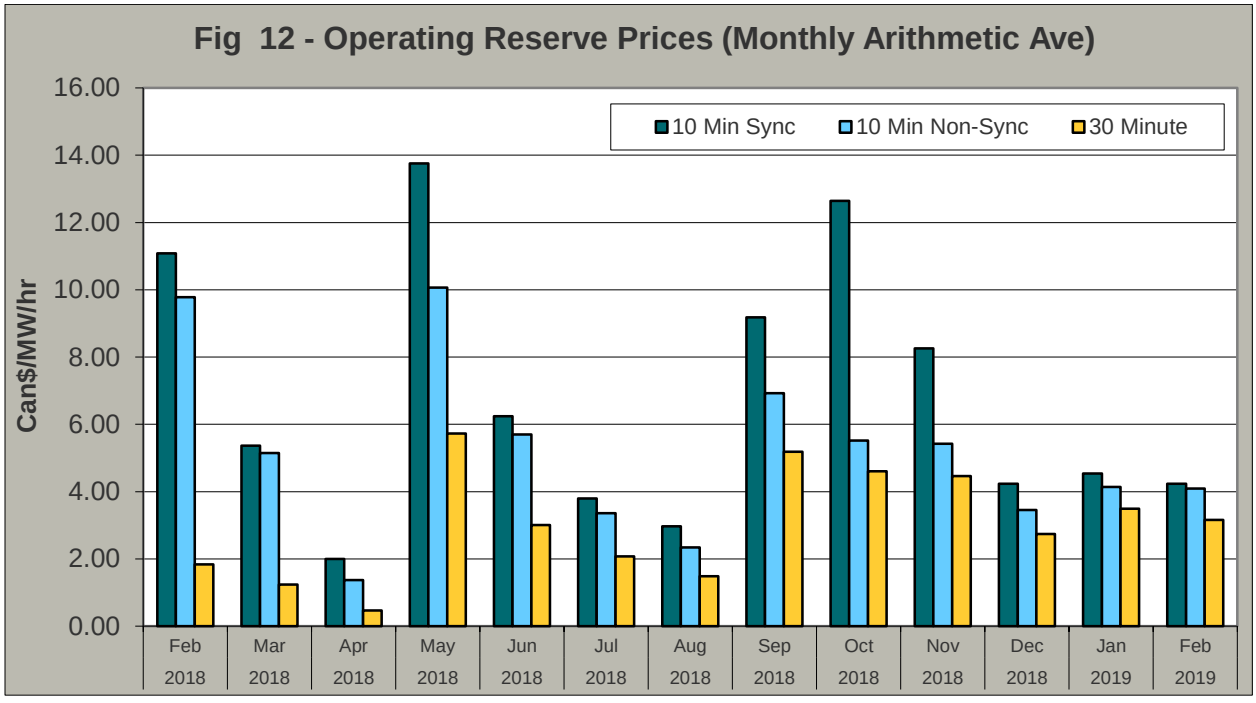
5.1 Weekly Hourly Ontario Energy Price (HOEP) Trends



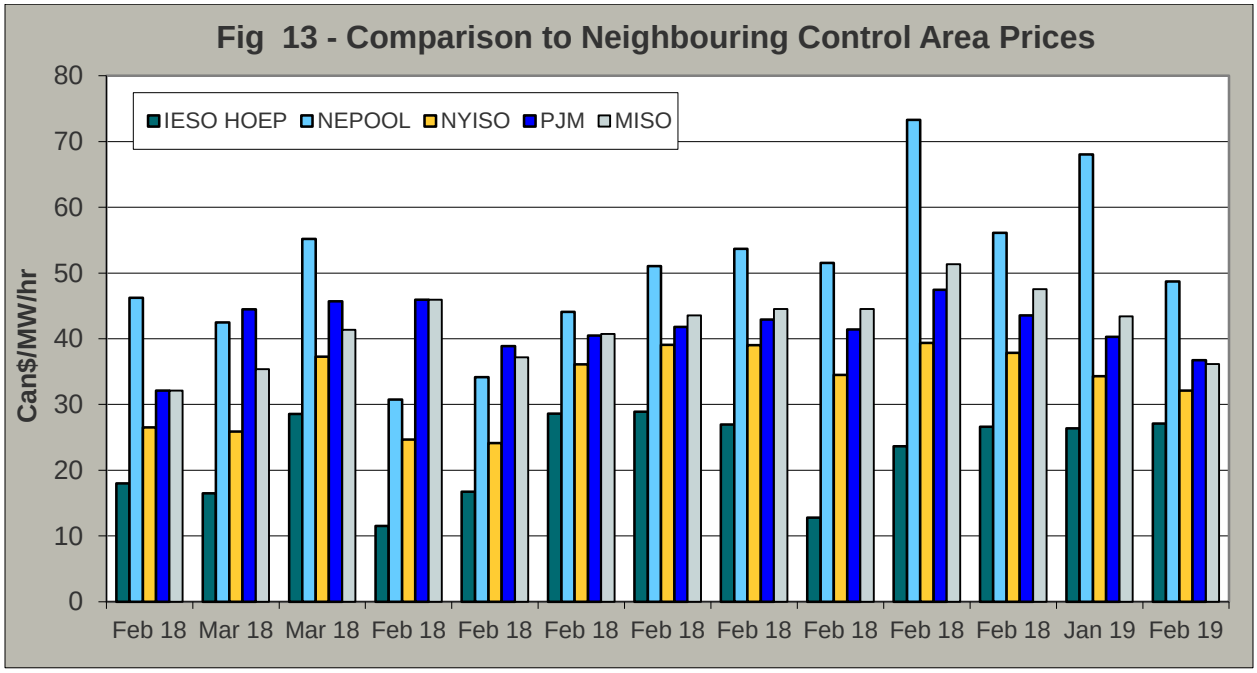
5.2 HOEP Prices (Monthly Arithmetic Ave)



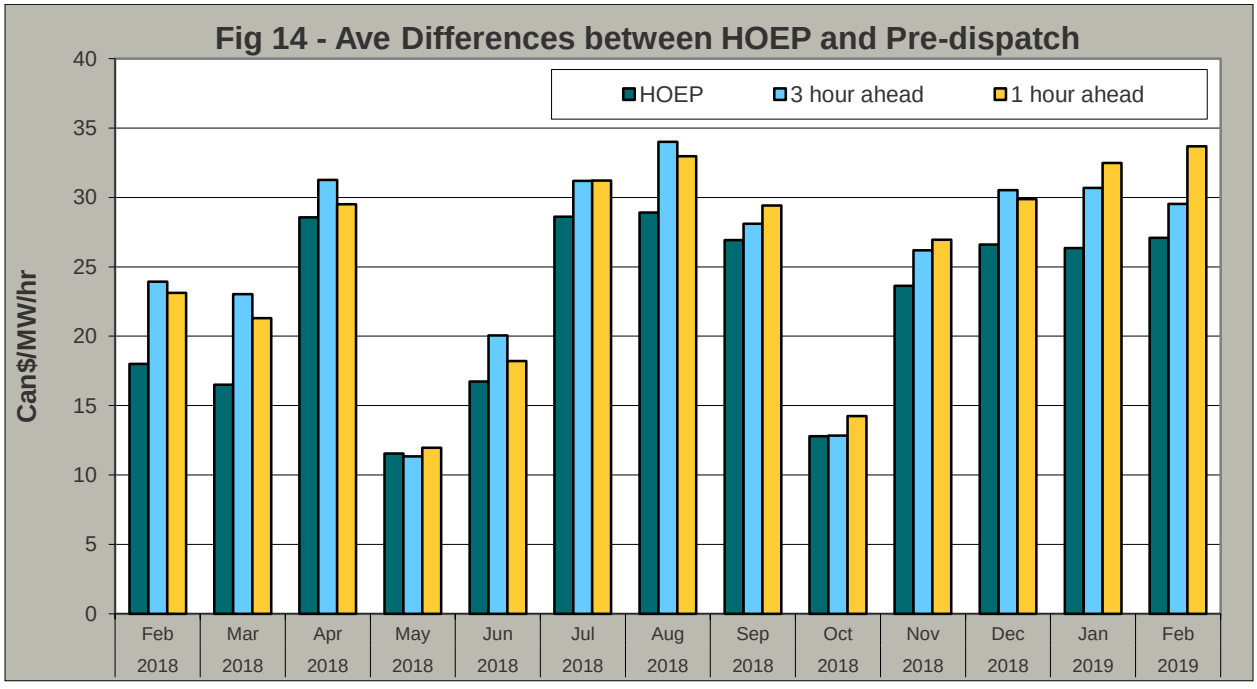
5.3 Operating Reserve Prices (Monthly Arithmetic Ave)



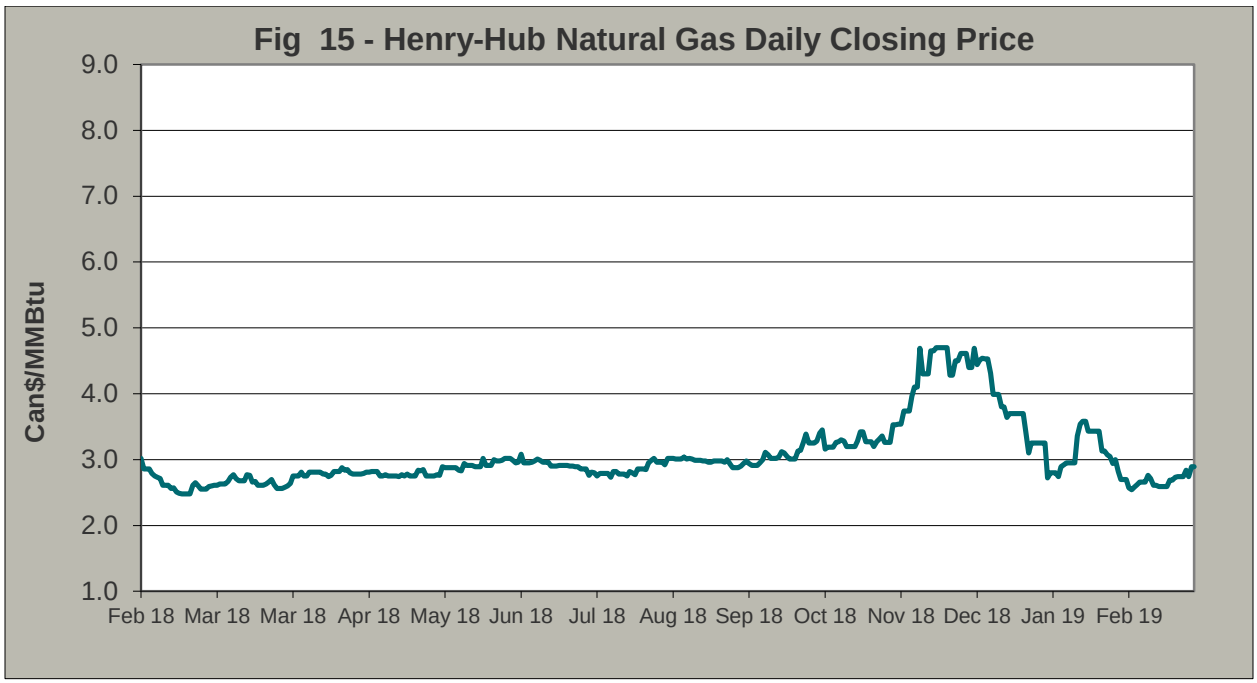
5.4 Comparison to Neighbouring Control Area Prices



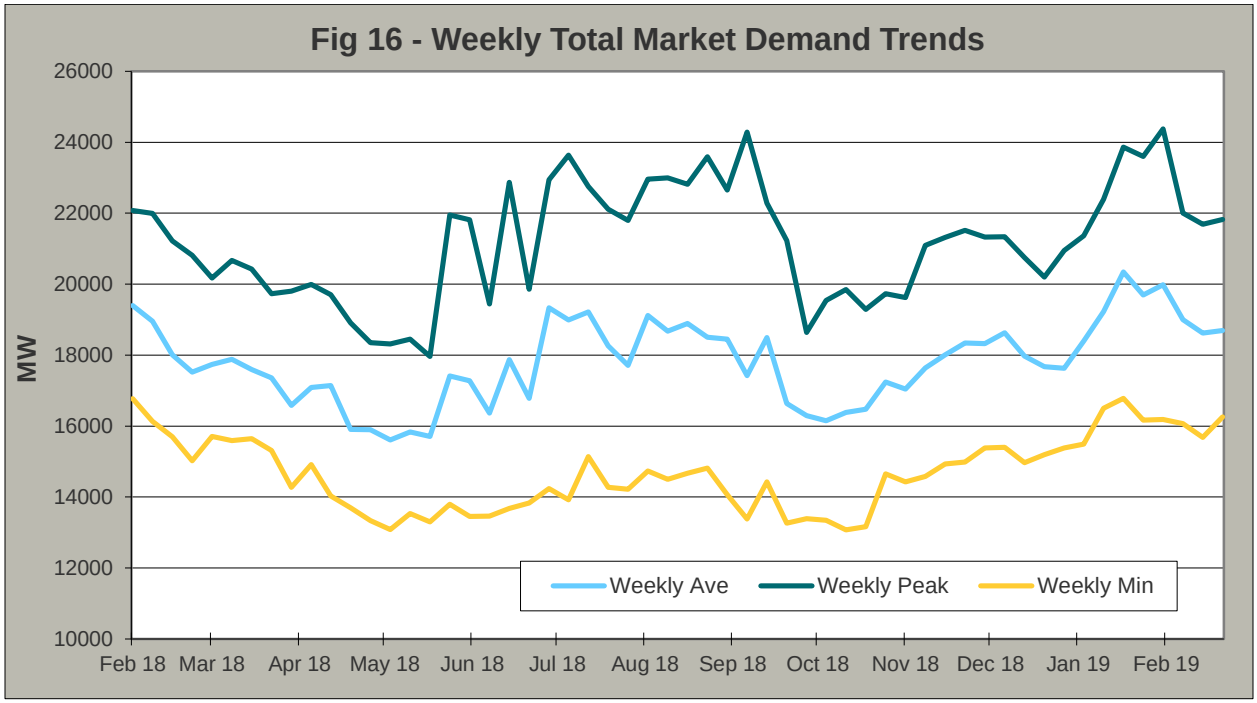
5.5 Ave Differences between HOEP and Pre-dispatch



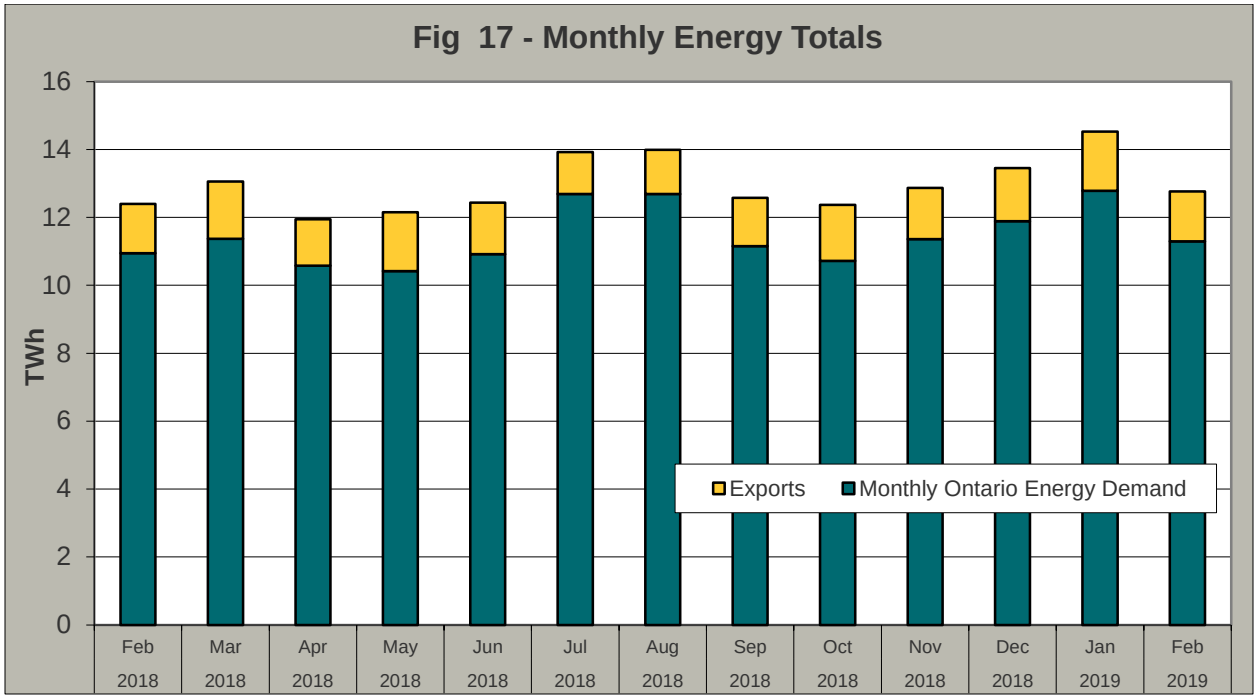
5.6 Henry-Hub Natural Gas Closing Price



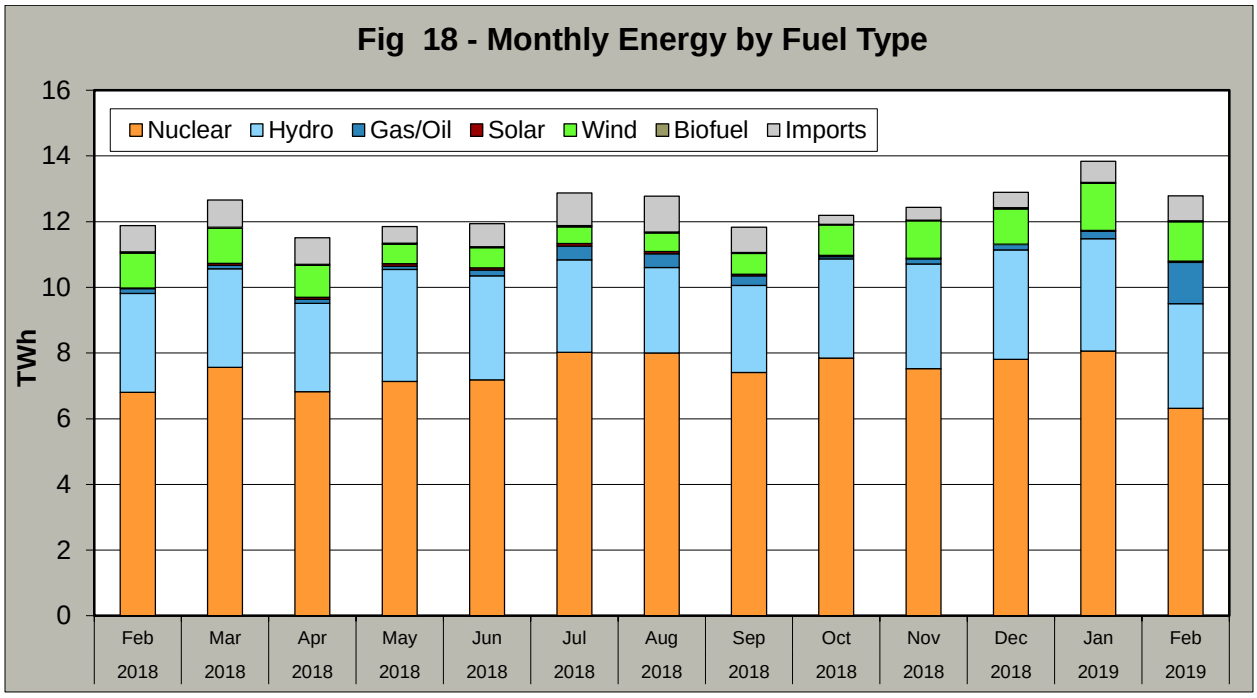
5.7 Weekly Market Demand Trends



5.8 Monthly Energy Totals

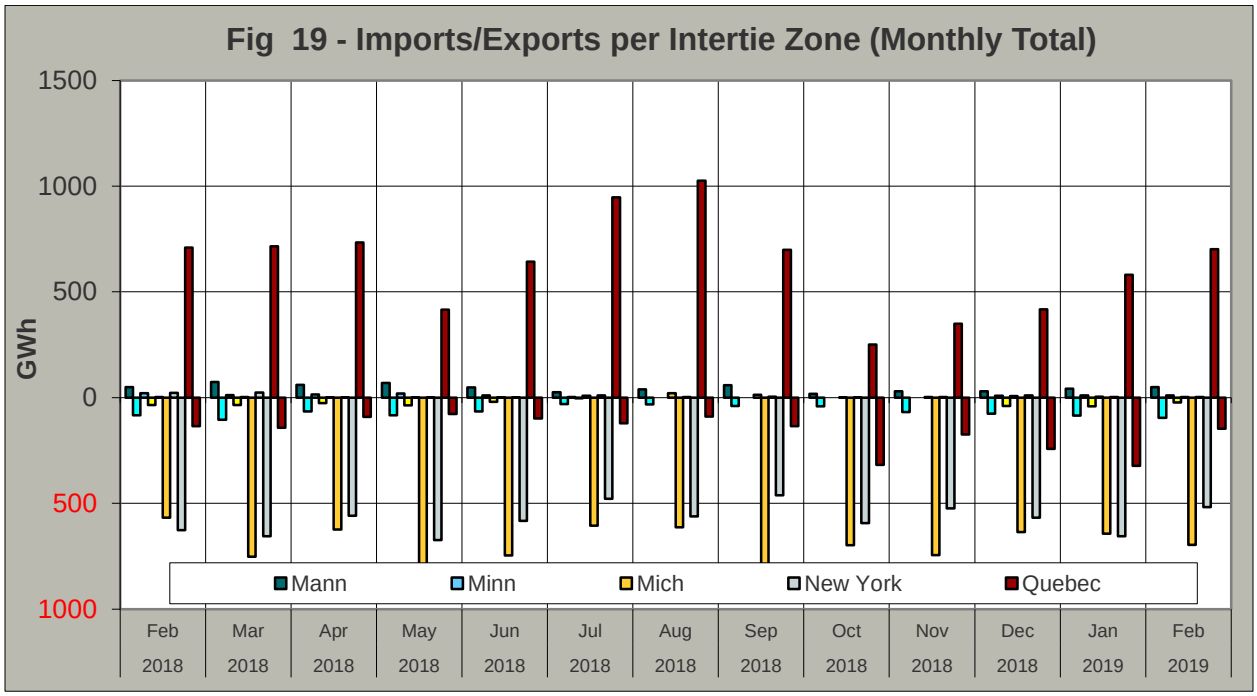


5.9 Monthly Energy by Fuel Type

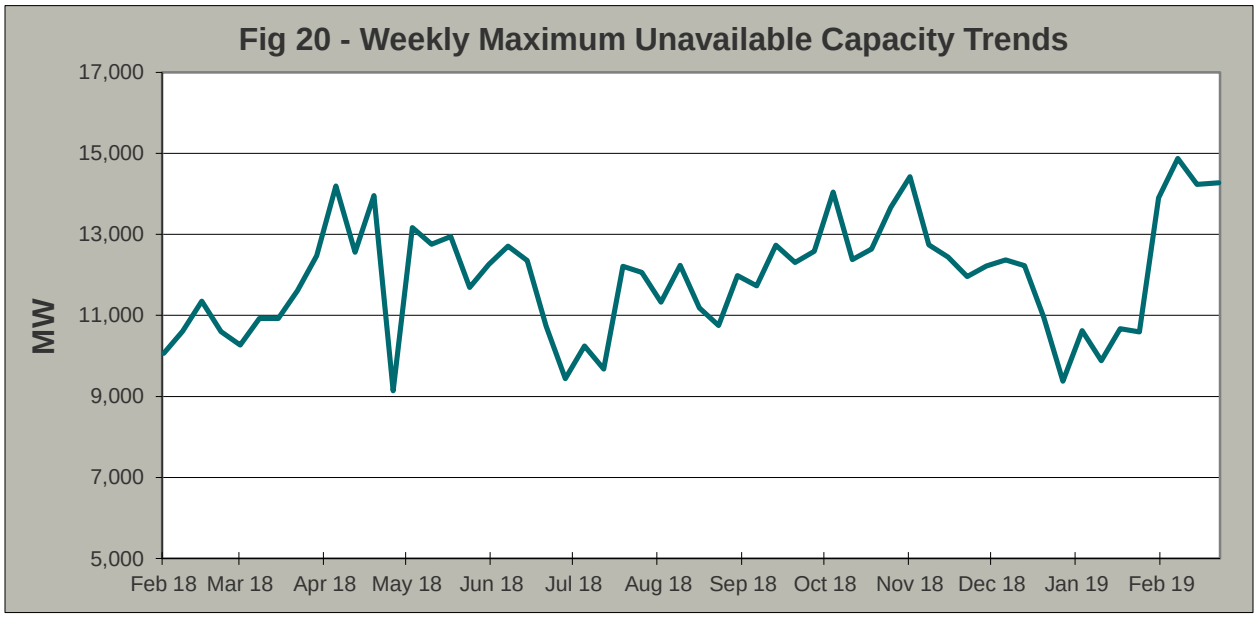


5.10 Imports/Exports per Intertie Zone (Monthly Total)

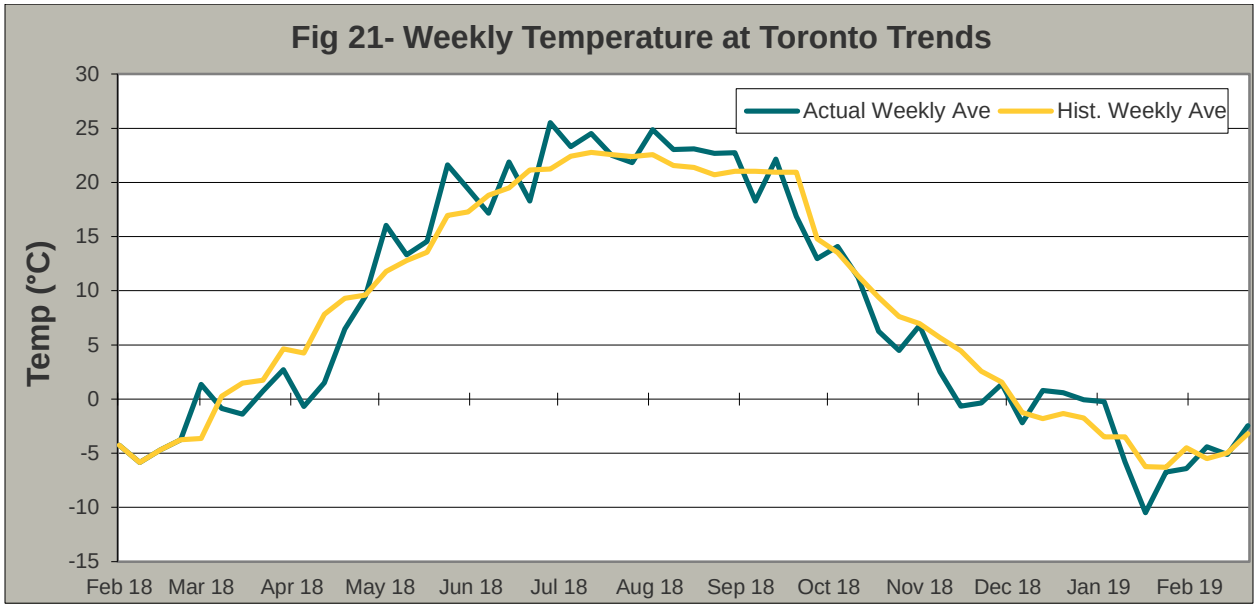
Note: Imports are depicted as above zero, whereas Exports are depicted as below zero



5.11 Weekly Maximum Unavailable Capacity Trends



5.12 Weekly Temperature at Toronto Trends



6 Global Adjustment

Global adjustment (GA) is the difference between the total payments made to certain contracted or regulated generators, and conservation programs, and any offsetting market revenues. The GA charge is applied to all consumers in Ontario, including those who pay the market price (HOEP) and those who have signed a contract with a licensed electricity retailer. For customers on the Regulated Price Plan (RPP), it is factored into the rate set by the Ontario Energy Board.

The GA is calculated as a total dollar amount for each month based on the difference between market revenues and the following components:

Wind

- Includes projects under Renewable Energy Supply, Renewable Energy Standard Offer Program, and the Feed-in-Tariff program

Biomass, Landfill and Byproduct

- Includes projects under Renewable Energy Supply, Renewable Energy Standard Offer Program, Feed-in-Tariff, converted OPG Atikokan and Thunder Bay facilities, and NUG contracts with the IESO

Hydro

- Facilities with agreements through Renewable Energy Supply Program, Renewable Energy Standard Offer Program, Hydroelectric Contract Initiative, Hydroelectric Standard Offer Program, and the Feed-in-Tariff programs. Also includes OPG's facilities that fall under the Hydroelectric Energy Supply Agreement.

Nuclear (non-OPG) and Natural Gas

- Bruce Power nuclear and natural gas facilities as well as OPG's Lennox (dual fuel).

Solar

- Includes projects under Renewable Energy Supply, Renewable Energy Standard Offer Program, and the Feed-in-Tariff program

Other Programs – IEI and Storage

- An Industrial Electricity Incentive (IEI) Program: An incentive for eligible consumers in Ontario to increase industrial production. Eligible activities include building a new, or expanding a facility, in a specific NAICS Canada 2012 sector.
- Storage: Includes facilities operating under the Phase II energy storage program

Funds and Financing

- Includes programs supporting community group in the design and delivery of renewable energy initiatives. It also includes contract penalties received from generators.

Conservation

- Conservation programs including Save on Energy and the Conservation Fund

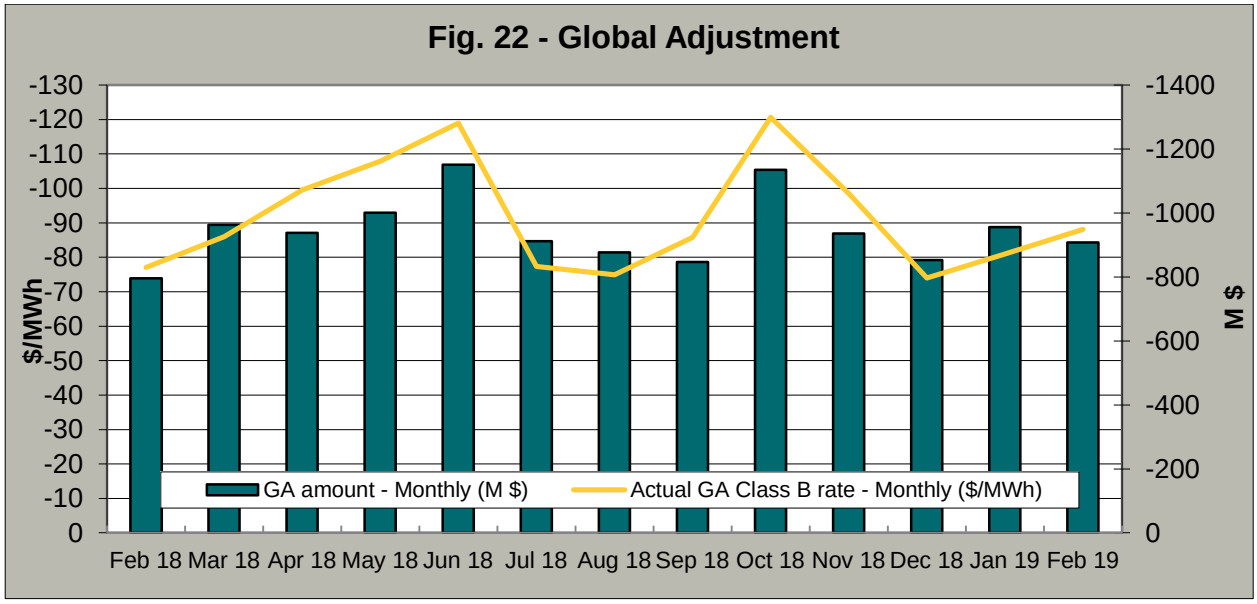
Ontario Power Generation – Regulated Nuclear and Hydro

- Regulated rates for OPG's nuclear and remaining hydro generation set by the Ontario Energy Board

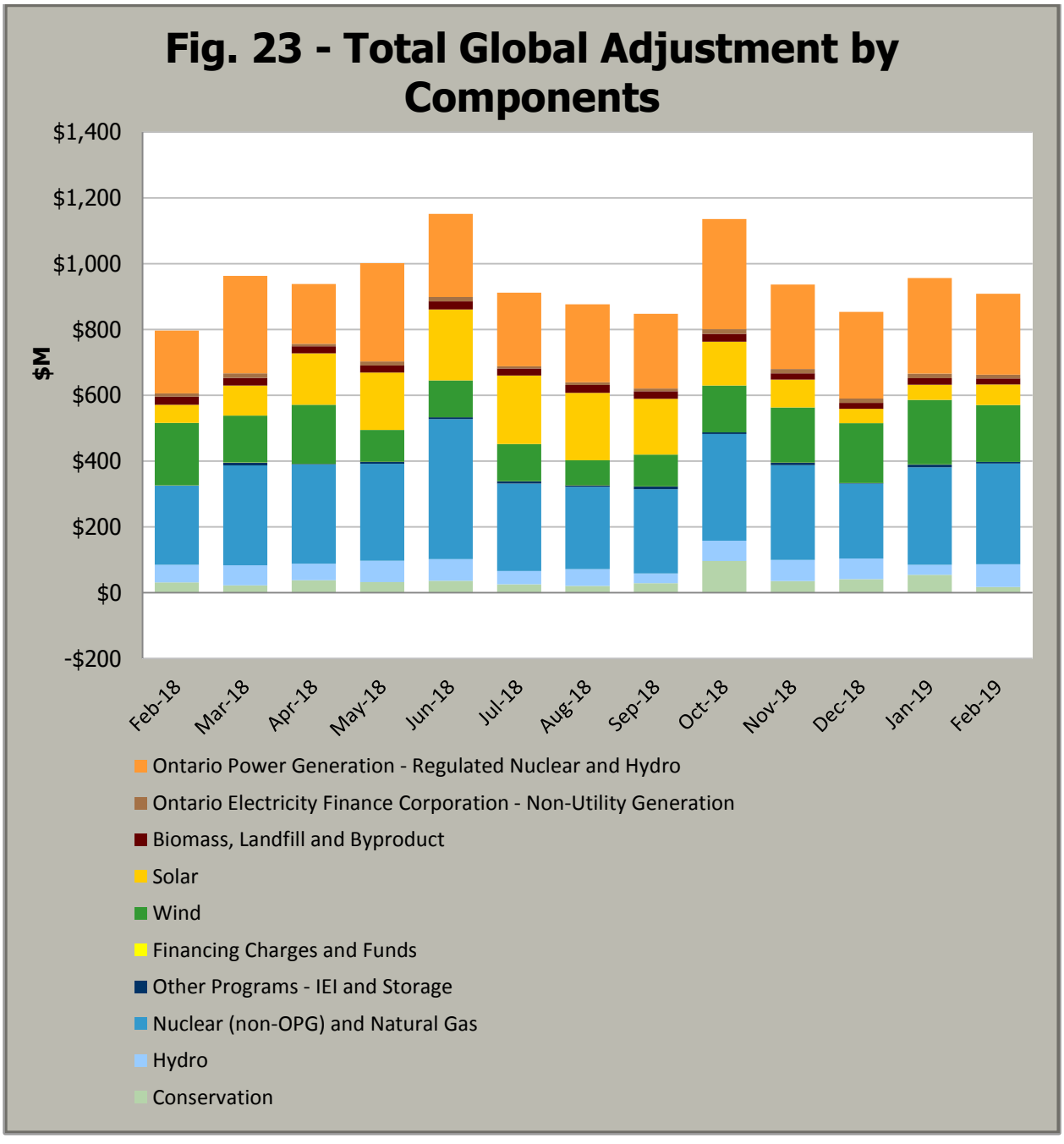
Ontario Electricity Financial Corporation – Non-Utility Generation

- Contracts administered by the Ontario Electricity Financial Corporation with existing generation facilities

Customers with an average peak demand over one megawatt and some customers with an average peak demand of between 500 kilowatts and one megawatt are eligible to pay for global adjustment based on a coincident peak calculation. All other customers pay the global adjustment based on the total amount of electricity they used for the month. For more information on how Class A and B customers pay the GA, see: http://www.ieso.ca/sector-participants/settlements/global-adjustment-components-and-costs. The total GA amount and the actual Class B rate are depicted below in Figure 22.



The graph below (Figure 23) highlights the components of the GA amount. The GA amounts increase or decrease in response to changes in HOEP. When HOEP is lower, the GA is higher to cover the additional payments such as for energy contracts, and regulated generation.



7 Summary of Wholesale Market Electricity Charges in Ontario's Competitive Marketplace

A summary of this month's market results that correspond with the charge items indicated in the chart below.

Fig. 24 – IESO Wholesale Market Summary	Arithmetic Average		Weighted Average	
	Current Month	Year-to-Date	Current Month	Year-to-Date
Commodity Charge				
HOEP	$27.08	$26.70	$27.89	$27.85
Actual Global Adjustment Class B Rate	$88.12	$84.24	$88.12	$84.24
Total	$115.20 /MWh or 11.52 ¢/kWh	$110.94 /MWh or 11.09¢/kWh	$116.01 /MWh or 11.60¢/kWh	$112.09 /MWh or 11.21¢/kWh
Wholesale Market Service Charges				
Hourly Uplift - CMSC	$ 0.79	$ 0.72	$ 0.79	$ 0.74
Hourly Uplift - IOG	$ 0.13	$ 0.14	$ 0.13	$ 0.14
Hourly Uplift - Other	$ 0.81	$ 0.86	$ 0.83	$ 0.89
Daily Uplifts	$ 0.12	$ 0.14	$ 0.11	$ 0.14
Monthly Uplift	$ 0.62	$ 0.59	$ 0.62	$ 0.59
IESO Administration[1]	$ 1.24	$ 1.24	$ 1.24	$ 1.24
Rural/Remote Settlement	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Monthly Class B Capacity-Based DR Recovery[2]	$ 0.26	$ 0.42	$ 0.26	$ 0.42
Overall Total	$4.47/MWh or 0.45 ¢/kWh	$4.61/MWh or 0.46 ¢/kWh	$4.48/MWh or 0.45 ¢/kWh	$4.66/MWh or 0.47 ¢/kWh
Wholesale Transmission Charge	$10.77/MWh or 1.08 ¢/kWh	$10.34/MWh or 1.03 ¢/kWh	$10.77 /MWh or 1.08 ¢/kWh	$10.32/MWh or 1.03 ¢/kWh
TOTALS	$130.44/MWh or 13.04 ¢/kWh	$125.89/MWh or 12.59 ¢/kWh	$131.26/MWh or 13.13 ¢/kWh	$127.07/MWh or 12.71 ¢/kWh

Note: Year-to-Date is since January 1 of report year
The debt retirement charge ended for all electricity users on March 31, 2018. This charge will no longer be applied to any electricity consumed as of April 1, 2018.

[1] The fee used in this table refers to the IESO Administration Fee charged to domestic consumers. The rate charged to exporters is $ 1.0115 /MWh

[2] The Monthly Class B Capacity Based Recovery charge listed above includes all costs incurred from the Capacity Based Demand Response program, the Demand Response Auction and the Demand Response Pilots. For more information on these three areas, please visit the Demand Response section found at www.ieso.ca.

There are two commodity charges quoted above. The arithmetic average price would be representative of the average commodity charge for a customer whose electrical demand is relatively consistent throughout the day, the night and the weekends. The weighted average price would be applicable to a customer whose consumption mirrored that of the total system. The actual average commodity price paid by a wholesale customer will be very sensitive to their consumption pattern.

The Wholesale Transmission Charge listed above has been calculated by summing all transmission-related fees paid by all loads in the province, and dividing that sum by the total energy delivered to those loads. As such, this number is not representative of the fee paid by any particular customer. Rather, each customer's actual fee for transmission service will depend on many factors such as peak consumption pattern and the types of transmission services applicable to the customer.

7.1 Renewable Generation Connection

In addition to the wholesale market charges listed above, participant invoices now include settlement amounts to recover certain costs incurred by distribution companies for the connection of new renewable generation to their local distribution system.

These charges are covered under charge type 1463 - Renewable Generation Connection - Monthly Compensation Settlement Credit. Costs are charged to participants based on their proportion of Allocated Quantity of Energy Withdrawn (AQEW) for the month, including embedded generation for LDCs. The monthly rates are summarized below:

Month, Year	Rate ($/MWh)	Preliminary/Final
January 2019	0.0209	Final
February 2019	0.0235	Preliminary

The recovery of these costs was enabled by Regulation 330/09, and the amounts are approved by the Ontario Energy Board. Further details regarding the decision EB-2010-0191 can be found on the OEB website: http://www.ontarioenergyboard.ca.

Questions on any information contained in this report should be directed to:
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