



Peak power problems: How Ontario's industrial electricity pricing system hurts consumers



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ABSTRACT

Under a program called High-5, reduced consumption during the five highest demand hours in a year results in a lower share of global adjustment charges to large industrials in Ontario, with costs transferred to smaller customers. The government should phase out the High-5 scheme and rely on a market-based demand management system as part of a capacity market.

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1. Introduction

High and rising electricity prices faced by industrial consumers in Ontario, Canada, are a concern for those worried about attracting and keeping businesses.¹ A recent survey by the Association of Major Power Consumers of Ontario (AMPCO) suggests that Ontario industrial businesses pay 26 to 29% more than businesses in New York and the New England states. Ontario businesses pay 40% more than the average business in 14 jurisdictions around the Pennsylvania-New Jersey-Maryland area. However, Ontario prices are high not only relative to the U.S., but also in comparison to other Canadian provinces.²

Such discrepancies suggest that businesses in Ontario suffer a cost disadvantage in comparison to competitors in other jurisdictions. The result could be the relocation of businesses and a flow of private investment capital away from Ontario to other competing jurisdictions. One of the government's main policy

approaches related to electricity pricing is the High-5 program, also known as the Industrial Conservation Initiative (ICI). The province introduced the High-5 program in 2011, and the government's 2014 budget brought more firms into the program.

The originally stated policy objective of the High-5 program was to provide large industrials with incentives to reduce peak demand. That would mean less need for investment in new generation and reduce the need for imports.³ Under the program, a large share of the annual electricity cost for eligible companies is based on consumption during the province's highest five demand hours during the year, and High-5 therefore encourages firms to reduce their consumption during those hours.

The program seems to meet two aims: reducing electricity costs for industry and reducing the need for investment in new peak-period generation. However, because actual peak hours are never known in advance, firms do not know which hours of the year will determine their electricity costs for the rest of the year. Is there a better way to meet the program's goals?

I find that the program encourages companies to reduce electricity consumption over a range of peak demand hours, not

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¹ An earlier version of this study is [Sen \(2015\)](#).

² Please see 'Ontario's big industries plead for lower hydro rates,' by John Spears, published by the Toronto Star on Feb 26, 2014, and available at http://www.thestar.com/business/2014/02/26/ontarios_big_industries_plead_for_lower_hydro_rates.html.

³ For further details please refer to <http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTEwNzI0&statusId=MTY2MTgw>.

Table 1
Total Global Adjustment Charge by Year (\$ Million).

Year	Total GA (\$M)	Total HOEP Costs (\$M)	Total Costs (\$M)
2005	−1,153.0	11,319.7	10,166.7
2006	654.0	7,368.8	8,022.8
2007	597.0	7,676.0	8,273.0
2008	900.7	7,651.6	8,552.3
2009	4,219.5	4,392.4	8,611.9
2010	3,847.7	5,381.8	9,229.5
2011	5,309.8	4,457.3	9,767.0
2012	6,455.7	3,405.3	9,861.0
2013	7,722.8	3,728.6	11,451.4
2014	7,034.9	5,032.8	12,067.7

Source: <http://www.ieso.ca/Pages/Participate/Settlements/Global-Adjustment-Archive.aspx> and <http://www.ieso.ca/Pages/Power-Data/default.aspx>.

only the top five hours. This is not surprising: I also find the potential cost that industrial consumers face during peak periods is higher than reasonable estimates of the cost of that peak-period electricity. Equally problematic, I find that the High-5 program has led to large cost transfers from some large industrial consumers to other consumers.⁴ A better solution would be to target consumption reductions through a tighter alignment of supply and demand. The government should move industrial customers from the blunt and imprecise High-5 program into a demand management program as part of the electricity market reforms under development.

2. Electricity prices for industrials in Ontario

Why are Ontario's electricity prices higher than those elsewhere? The reasons include: the Ontario *Green Energy Act*, which subsidizes clean electricity generation; the existence of contracts that mandate generous fixed prices for electricity supply; the costs of nuclear plant refurbishment, new transmission and distribution infrastructure; and the effects of new peak-period-supplying power plants coming online. There is no doubt that average electricity bills reflect the cumulative effects of the above factors and the legacy costs of Ontario Hydro's debt. (See [Goulding \(2013\)](#) for more on the causes of increasing energy prices.)

One particular component of higher electricity costs for consumers is the Global Adjustment (GA). The province established the GA in 2005, and initially called it the Provincial Benefit because, at the time, wholesale market prices were expected to be above the Ontario Energy Board-regulated rates that consumers were paying. Ontario consumers would then receive the benefits of this price difference through the Provincial Benefit.⁵ However, the relationship between wholesale prices and consumer prices has since reversed. The province renamed the Provincial Benefit as the Global Adjustment, which is now a charge to electricity purchasers that is passed on to retail consumers. It is intended to recover any shortfall between generators' wholesale market revenue, on one

⁴ There are other incentive and rebate programs for industrials. One example is the Northern Industrial Electricity Rebate program through which participants can receive a rebate of 2 cents per kilowatt hour with individual rebates capped at 2011–12 consumption levels, or \$20 million per year per company (<http://www.mndm.gov.on.ca/en/northern-development/business-support/northern-industrial-electricity-rate-program>). There are also other sector specific rebates and programs available for the following industries: Iron and Steel, Pulp/Paper, Petroleum, Mining, Automotive, Cement & Non-Metallic Mineral, and Food & Beverage. For more information please go to <https://saveonenergy.ca/Business/Programs-By-Sector.aspx>. Further, industrial companies might be eligible for lower electricity rates through the Industrial Electricity Incentive program. The qualifying conditions for this program are either an expansion in operations or job creation.

⁵ Further details on the history of the GA are available from the Ontario Electricity Conservation and Supply Task Force Report, available at http://mccarthy.ca/article_detail.aspx?id=1468.

hand, and the costs of generation plus various demand and conservation programs, on the other.⁶ For example, if a generator has a contract to deliver energy at a price of \$70/MWh but the hourly Ontario energy price (HOEP) is only \$40/MWh, customers must pay a GA charge of \$30/MWh to meet the generator's guaranteed price, set out in fixed, long-term contracts with the province.⁷

The total GA charge payable by all Ontario consumers has been rising ([Table 1](#)).⁸ The negative values in 2005 were attributable to high wholesale prices that surpassed the retail prices for consumers. However, since then, regulated rates and prices paid under contracts to generators have, on average, exceeded the average HOEP and this gap has grown considerably over time. This means customers have faced rising Global Adjustment charges. From 2006 to 2014, total GA charges have risen from \$654 million to \$7 billion. On the other hand, total HOEP costs to all customers over the same time period have correspondingly declined over time from over \$7 billion to approximately \$5 billion, partially reflecting reduced demand.⁹

Averaged across months, the GA on a per MWh basis was 52% higher in 2013 than in 2010. On the other hand, averaged across months, the weighted average HOEP in 2013 was 28% lower than in 2010. From 2006 to 2013 HOEP costs have declined from 90% to slightly above 30% of total electricity costs, while GA charges over the same period have climbed from less than 10% to slightly under 67% ([Fig. 1](#)). Further, the HOEP rose from 2013 to 2014, and the GA declined, although not as much as the HOEP rose.

3. High-5 Global Adjustment

Owing to the increasing size of the GA, and aiming to promote conservation, the Ontario Ministry of Energy implemented program changes effective as of January 2011. The province designated electricity consumers in Ontario as either Class A (large electricity consumers that have an average peak demand of more than 5 MW for a defined base period) or Class B customers (smaller industrials, commercial, and residential). Class A consumers account for about 20% of annual consumption in the province ([Ontario Energy Board, 2013](#)). The province lowered the eligibility threshold for Class A customers to 3 MW of demand in the 2014 budget ([Ontario, 2014](#)).

GA charges for Class A customers now are based on their average energy consumption during the five highest load hours that occur in Ontario each year, which are called the High-5 h. The new billing structure is explained in the November 2011 Monitoring Report by the Market Surveillance Panel:

⁶ Until 2015, generators obtained long-term fixed-price contracts from the Ontario Power Authority (which has since been merged with the Independent Electricity System Operator (IESO)), or the Ontario Electricity Financial Corporation. Wholesale markets are competitive, with generators being able to offer electricity to purchasers, such as large industrials and local distribution companies. The distribution companies then sell to small customers at retail prices fixed by the Ontario Energy Board. The wholesale HOEP will cover the short-term marginal costs of sellers, but is not high enough to cover the initial costs required to set up power plants. Regulated price contracts for generators are therefore intended to attract generation capacity and ensure a sufficient and stable supply of electricity.

⁷ Of course, this is an illustrative example. There are other factors, such as fuel mix and other programs that might also contribute to the magnitude of GA charges.

⁸ A possible reason for higher GA charges is a fall in energy demand. Specifically, fixed costs from new investment have to spread over reduced demand, which results in a higher Global Adjustment.

⁹ I calculate HOEP costs for Ontario by taking estimates of average annual HOEP and multiplying it by total Ontario energy demand. These data are released by the IESO. The price data are available from <http://www.ieso.ca/Pages/Power-Data/price.aspx> while annual Ontario energy demand can be found at <http://www.ieso.ca/Pages/Power-Data/demand.aspx>.

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