What Goes Up…

Ontario's Soaring Electricity Prices and How to Get Them Down

by Ross McKitrick and Tom Adams

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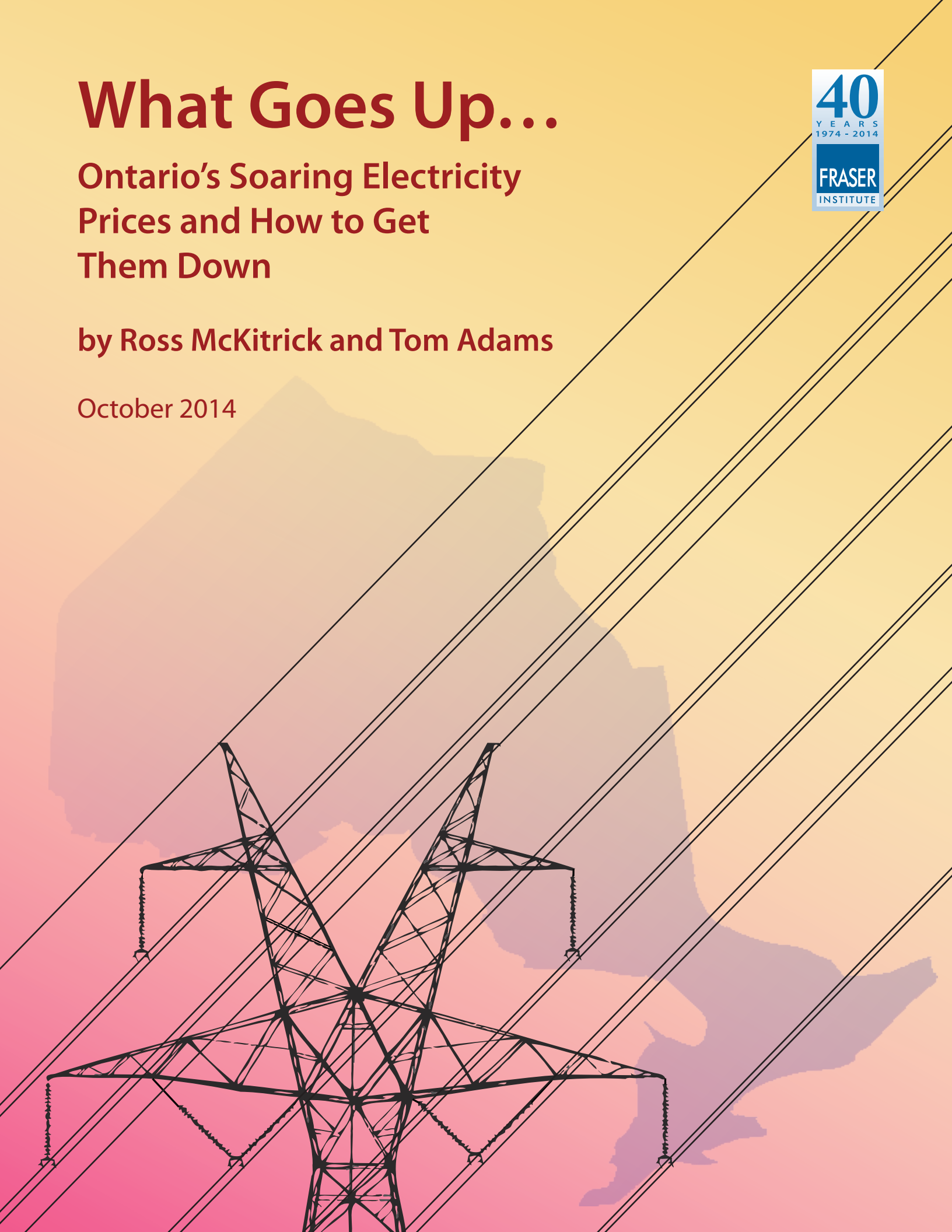

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Executive summary

The costs of running Ontario's power system have risen much more rapidly than inflation in recent years, despite a decline in competitive wholesale market prices for power. Of the major components of electricity rates, commodity costs are rising fastest, and are the focus of this study.

The commodity portion of Ontario electricity prices is comprised of a competitive market-clearing component (the Hourly Ontario Electricity Price or HOEP) and a centrally planned surcharge, now called the Global Adjustment (GA), that directs funds to generating units based on revenue contracts with the Province. Over the past decade, the market-clearing component has fallen to a relatively small component of Ontario electricity prices, while the centrally planned surcharge has risen six-fold—from a credit of about $10 per MWh to about $60 per MWh (6 cents per kWh). While the market-clearing component closely tracks neighbouring markets, the centrally planned costs are unique to Ontario. The centrally planned component of Ontario's power costs has become the dominant allocation mechanism in Ontario electricity pricing, which in turn means that relatively little of Ontario's electricity market is guided by competitive market price signals.

To understand why Ontario electricity prices are rising, we need to explain what drives the centrally planned Global Adjustment. One complicating factor is that some new renewable and non-renewable generators are paid not only based on their outputs but also based on their total capacities. Consequently our analysis looks at both capacity development and actual power generation.

After describing the GA, we develop an econometric model to determine the key system elements that drive the level of the Global Adjustment. We gather monthly data spanning 2005 to 2013 on the GA, the HOEP, capacity and output by generator type (wind, gas, solar, nuclear, hydro, and coal), and exports and imports. As a simple focus on direct cash flows to various generators would fail to account for the interactions between different components of the generation mix, we constructed a multiple regression model of the GA as a function of these explanatory variables. The model presented here explains close to 90 percent of the variance in the GA over the sample period.

The results are as follows:

1. We estimate that solar and wind systems provide just under 4 percent of Ontario's power but account for about 20 percent of the average commodity cost. By comparison, the Ontario Energy Board (2013) forecast that, in 2014, solar and wind would produce 7 percent of total supply and their direct costs would account for about the same fraction of the average commodity cost.

2. Each additional 1 MW of new wind capacity adds about $0.02/MWh to the Global Adjustment, after taking into account the offsetting effect of revenues from wind production. The system-wide cost effect is about 3.6 times the direct Feed-in-Tariff (FIT) payment burden.

3. Each additional MW of new hydro over the past decade has added about $0.015/MWh to the GA. Factors behind the deteriorating performance of hydroelectric generation warrant further investigation.

4. Solar power generation has large marginal effects on the GA, which have been concealed by the relatively minimal amounts generated so far in the province. An increase of 1 MWh per hour, on average over a month, will cause the GA for that month to rise by about $0.016/MWh.

5. Reductions in coal-fired power generation in Ontario were associated with statistically significant increases in the GA.

6. Imports can potentially reduce the GA, but exports occur under circumstances that increase it. Ontario is a large and growing power exporter. Encouraging greater domestic consumption at times of surplus baseload would reduce power costs in Ontario.

We recommend measures such as a moratorium on new renewable power facilities, pursuit of regulatory and legislative options to reduce the amount of installed renewables capacity, restarting 4 of 12 coal-burning units at Lambton and Nanticoke that can operate as cleanly as natural gas plants, suspending conservation programs when the province has surplus baseload, and exploring the option of large-scale imports of power from Hydro Quebec to bridge the interval for nuclear power plant refurbishment.