YOUR HOME ELECTRICITY BILL

A study on the costs in Ontario

environmental defence

INTRODUCTION

The cost to power and heat our homes is something many Ontario residents pay close attention to. The colder-than-normal winter and news reports about rising electricity prices have made energy costs a top of mind issue in the province.

People want to know why their bills are rising and what governments can do to help. And if they're feeling a pinch in the pocketbook, many want to know who or what to blame.

Renewable energy, as the relative new kid on the block in Ontario's energy supply, has shouldered much of the blame in the public debate over electricity costs. But is that blame entirely accurate or is some of it overblown?

This study, based on independent research, breaks down the role that renewable energy plays in home electricity bills, today and in the future, as well as the impact of improved energy efficiency.

The study shows that renewable energy accounts for a relatively small part of residential electricity bills. It also shows that the anticipated reduction in home energy use can offset a large part of the projected increase in electricity prices, which is good news for Ontario residents.

TODAY'S ELECTRICITY BILL

Environmental Defence hired Power Advisory, a respected energy consultancy firm, to explain the average home electricity bill.[1]

In Ontario, our bills are divided into several components:

- **Electricity:** This shows how much a customer is paying for electricity per month. It's made up of two types of charges and can be broken down into different sources of electricity, as shown in Figure 1.
- **Delivery:** This is the cost to deliver electricity to our homes, including the price to build and maintain big transmission lines and the smaller-scale distribution into neighbourhoods.
- **Regulatory Charge:** This is the cost of administering the electricity system.
- **Debt Retirement Charge:** This is to repay the nearly $20 billion in stranded debt accumulated by Ontario Hydro, three quarters of which came from financially unsustainable nuclear plants.[2]
- **HST:** This is the Harmonized Sales Tax.
- **Ontario Clean Energy Benefit:** This refers to a 10 per cent rebate on electricity bills that was brought in to help offset the impact of the HST.

As Figure 1 shows, all non-hydro renewable energy – solar, wind and bioenergy (energy produced from biological sources) - currently accounts for approximately 9 per cent of the average home electricity bill.

Figure 1: Example of an average residential monthly electricity bill in 2014 (based on 800 kWh/month)*

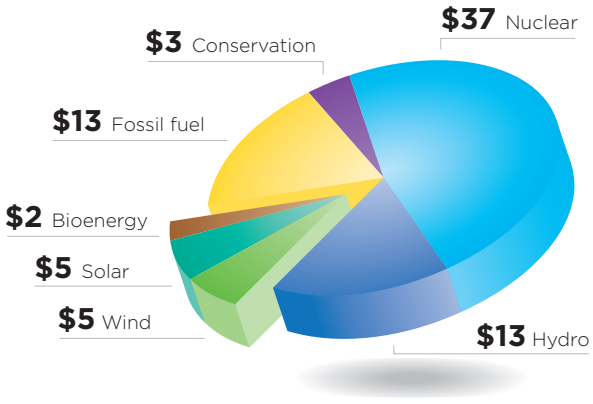
Ontario Residential Monthly Bill Statement

Account Number
123 456 789 101 2345 0

Meter Number
1234567

Your Electricity Charges

Electricity	$78.00
Delivery	$46.00
Regulatory Charge	$5.00
Debt Retirement Charge	$6.00
H.S.T.	$17.00
Ontario Clean Energy Benefit 10 per cent off applicable electricity charges and taxes	$(15.00)
Total	**$137**



* 800 KWh/month is the average household electricity use that the Ontario Power Authority uses in its calculations.

In order to understand our electricity bills today, it's useful to have a little historical background.

Previously, electricity prices in the province were kept artificially low with the heavy use of tax subsidies. This led to chronic underinvestment in Ontario's electricity infrastructure, which contributed to instability in the power grid.

In 2003, the massive blackout demonstrated how fragile Ontario's electricity system had become after years of neglect. On the hottest days, the grid was straining to keep up with demand. Since then, Ontario has spent billions to rebuild and modernize our electricity system. The result is our system is much more stable.

A decade ago, Ontario's electricity system was also very polluting. Coal-fired electricity pumped millions of tonnes of pollution into the air every year, causing smog and health problems like asthma, lung damage and premature death. And there were some very real costs associated with this. Coal-fired electricity used to cost Ontario an estimated $4.4 billion in health care, environmental and financial impacts.[3]

The good news is Ontario's grid is now coal-free, and the number of smog days has dropped from a record of 53 in 2005 to just two in 2013, which is better for our lungs and the environment.[10]

Closing the coal plants added costs to electricity generation because it meant replacing them with cleaner alternatives. But it also brought cost savings elsewhere, as the province doesn't need to continue to pay for things like hospital costs associated with coal pollution. Though it isn't reflected in our electricity bills, these savings mean money can be better spent elsewhere in our health care system.

Similarly, we don't see savings on our electricity bills for the improved quality of life that comes with being able to enjoy the summer without the suffocating smog days the province used to experience. But that doesn't mean the smog-free days don't have value for Ontarians who now find it easier to breathe on hot days.

It's clear that Ontario's electricity system needed investment, and the changes over the last 10 years have made it more reliable and less polluting. The costs of that have been felt on our electricity bills each month, while the benefits are felt elsewhere in the economy and in our day to day lives.

As to what energy should replace polluting coal electricity, it helps to compare the costs of different options. Replacing coal electricity with wind energy (which represents the bulk of non-hydro renewable generation contracts now) was in the same cost range as riskier options, like new gas or nuclear plants, which have bigger environmental impacts and unpredictable fuel prices. For example, the Ontario government estimates that new gas generation costs between $85-$296 per Megawatt hour (MWh) and new nuclear generation costs between $87-$143/MWh, while wind energy costs $115/MWh.[4]

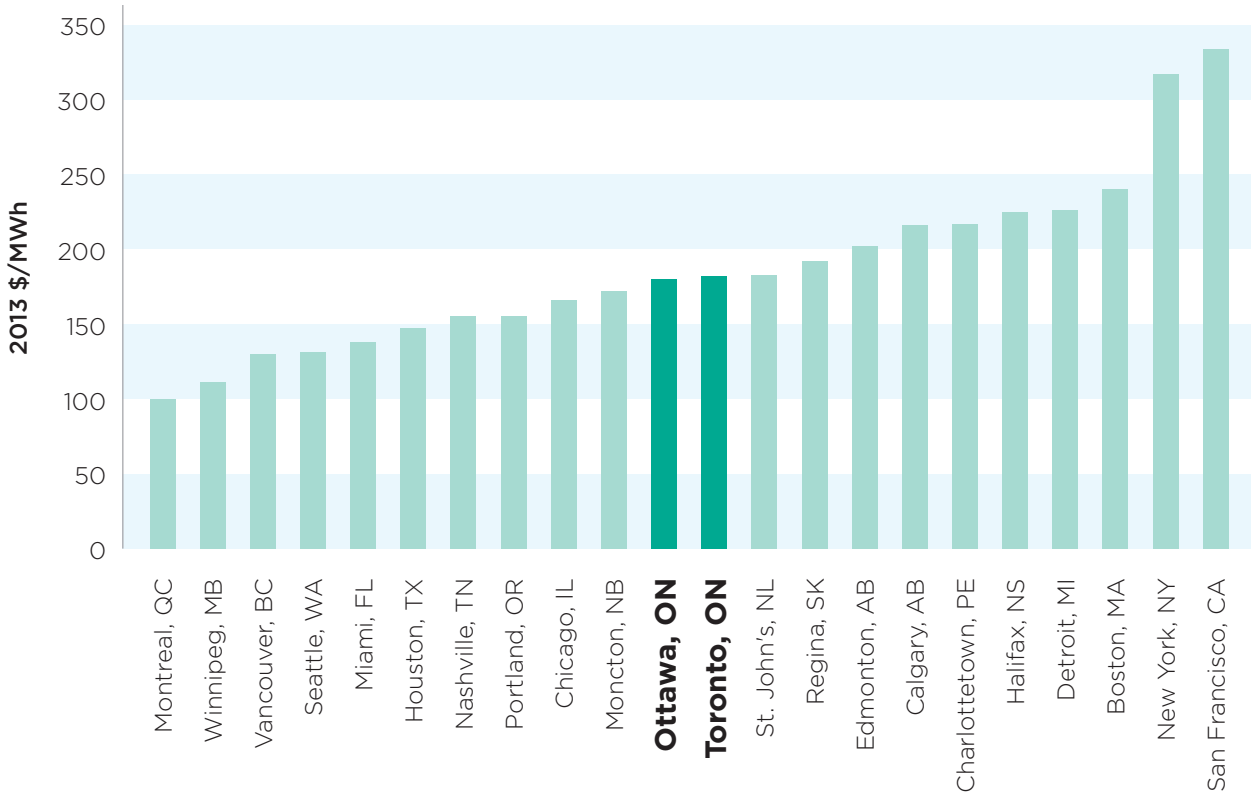
In fact, the cost of new nuclear plants would likely be even higher than this. Often, the true costs of nuclear power are partially masked because they don't include project over-runs.

Previous cost over-runs from nuclear projects are now being paid down through the Debt Retirement Charge. (And operators aren't fully responsible for all the long term costs associated with the plants.) In contrast, renewable projects rarely have cost over-runs – another reason why renewables are a good choice for replacing energy generated previously by coal.

HOW ONTARIO STACKS UP

Are Ontario residents being saddled with unfair electricity bills? Each year, Hydro Quebec benchmarks home electricity costs in major North American cities. As Figure 2 shows, Ontario cities ranked around the middle of the pack in 2013.

Figure 2: Comparative Index of Electricity Prices for Residential Consumers[5]



It's important to note that Ontario's electricity bills are lower than some places with a heavy reliance on coal generation like Alberta, Saskatchewan and Nova Scotia. Residents in those provinces are still dealing with the smog, health problems and health care costs of coal, and paying more than Ontarians for it.

TOMORROW'S ELECTRICITY BILL

Power Advisory, the energy consultancy firm, also modeled the projected breakdown of residential electricity bills between now and 2032. These are estimates based on real 2014 dollars – meaning inflation has been taken into account – and a constant amount of electricity use by the average home of 800 kWh/month. Later, we'll discuss that this might be an over-estimate of real costs because electricity use is anticipated to decrease per household.

Residential electricity bills will feel an impact when the Ontario Clean Energy Benefit expires in 2015. The average homeowner will see a $15 increase when the benefit expires, yet this change is not the result of the rising cost of supplying or delivering electricity. It's the result of the expiry of a rebate that was brought in to help offset the impact of the HST.

Over the next few years, more renewable energy production will be factored into electricity costs. While these renewable energy contracts are often blamed for rising electricity bills, they continue to make up a relatively small part of the overall energy supply. Their share of residential electricity costs rise from 9 per cent today to 16 per cent in 2024, and 12 per cent in 2032. In the overall picture of electricity bill charges, this is a fairly small amount.

The anticipated rise in electricity costs for residential customers in the near term is a combination of several factors: the expected removal of the Clean Energy Benefit in 2015, increased cost of supplying electricity and increased cost of delivering electricity. Renewable energy is responsible for a portion of this, but a small portion.

Ontario had to build new generation as coal plants were phased out, and any new electricity generation source would come with a comparable increase in cost. Choosing renewable energy was not only the cleanest option, but it also insulates Ontario from future increases in fuel costs like natural gas or coal. Energy provided by the wind and the sun will always be free. The same can't be said for other sources of energy.

TRENDS IN ELECTRICITY COSTS

The projection of future costs assumes that the planned refurbishment of the Darlington and Bruce nuclear plants proceeds as budgeted. However previous nuclear projects in Ontario have cost an average of 2.5 times more than expected.[6] While the cost of renewable energy is relatively fixed when a contract is signed for a project, ratepayers could find themselves saddled with higher costs than expected if the nuclear refurbishment projects go over-budget as has happened before.

Figure 3: Example of an average residential electricity bill in 2024 (based on 800 kWh/month)*

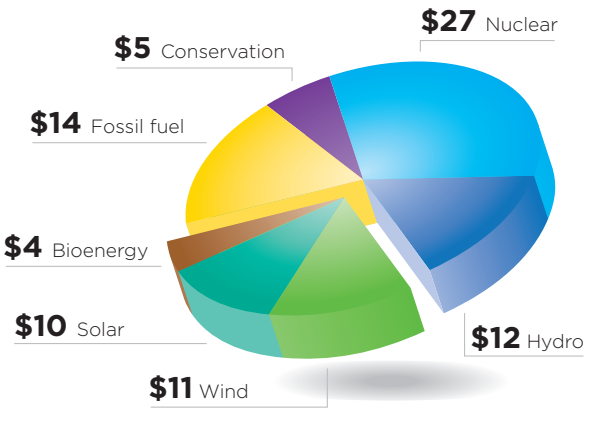
Ontario Residential Monthly Bill Statement

Account Number
123 456 789 101 2345 0

Meter Number
1234567

Your Electricity Charges

Electricity	$83.00
Delivery	$51.00
Regulatory Charge	$5.00
Debt Retirement Charge	$0.00
H.S.T.	$18.00
Total	**$157**



* 800 KWh/month is the average household electricity use that the Ontario Power Authority uses in its calculations.

Meanwhile, the Ontario Power Authority predicts that the cost of new solar and wind energy will decrease by 42 per cent and 28 per cent respectively by 2032, while nuclear energy costs will rise.[7] A report from a respected European bank, Deutsche Bank, estimated that solar energy is already cost competitive with other sources of electricity in several countries and is closing the gap in Ontario.[8]

TRENDS IN ENERGY EFFICIENCY

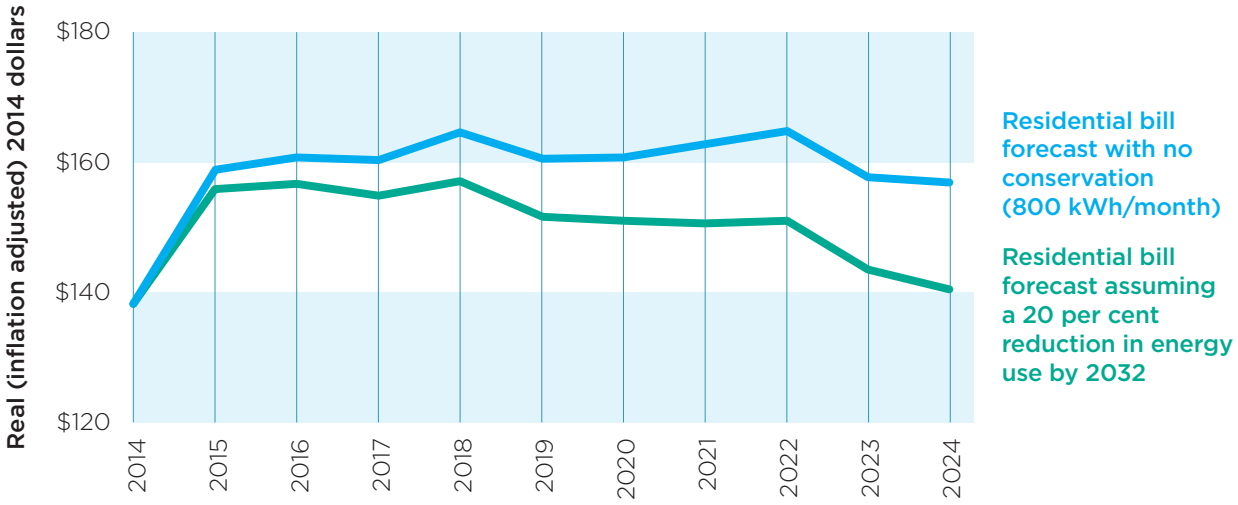
The projections used in Figure 3 (for the price of the average electricity bill a decade from now) assume that over 10 years households will keep using the same amount of electricity as they do today. But this assumption doesn't fit with current trends toward improved energy efficiency or reflect energy conservation initiatives underway in Ontario. For example, appliances are becoming more and more energy efficient, and smart meters are helping households reduce electricity use. This means that households are likely to use less electricity over time, and this will help offset the increase in electricity rates.

Based on data from the Ontario Power Authority, the chart below (Figure 4) illustrates the actual electricity bill costs if households used an average of 20 per cent less electricity by 2032. It shows a rise in bill costs when the Ontario Clean Energy Benefit expires, but then a levelling off and gradual decline.

If Ontario households increase energy conservation and energy efficiency, Ontario bills in 10 years could ultimately return to current levels. That's why if we work to cut energy waste, the pocketbook pinch for Ontarians will be much smaller than many realize.

The Ontario Power Authority predicts that the cost of new solar and wind energy will decrease by 42 per cent and 28 per cent respectively by 2032.

Figure 4: Residential bill forecast incorporating declining electricity use per household[9]



CONCLUSION AND RECOMMENDATIONS

Rising energy costs are, largely, a fact of life. In the past, knee-jerk decisions to deal with concern over energy costs have created some of the challenges we're currently facing. False solutions like subsidies might feel good today, but cost even more tomorrow.

The best way to help Ontario residents manage electricity costs is through improved energy conservation. Getting rid of polluting coal electricity and making the much-needed investments in the electricity grid were both necessary, and meant money needed to be spent, whether on renewable energy or other riskier sources. Renewable energy is the best option for our environment, and with the costs of it dropping fairly quickly, it's becoming more and more appealing for the pocketbook too. Today, renewable energy makes up a relatively small part of residential electricity bills in Ontario. And it will continue to do so into the future.

While there's no silver bullet to reduce electricity prices, there are steps that governments can take now to make electricity as affordable as possible while maintaining a sustainable and reliable electricity system.

Governments can help households by:

1. **Helping homes to become more energy efficient:** Municipal and provincial governments can help Ontario residents retrofit their homes to be more energy efficient – saving electricity and gas costs – with programs like on-bill financing, retrofit grants or allowing costs to be paid back over time through property taxes. Utilities also have an important role to play to encourage home retrofits.

2. **Adopting North American leading efficiency standards:** Ontario can adopt North America's most stringent electricity codes and standards for items like household appliances. That way, we know we're getting the most efficient option on the market when we buy new products.

3. **Establishing mandatory home energy audits:** Requiring that houses for sale provide a review of their energy efficiency (or lack thereof) allows buyers to know what they're getting into in terms of energy costs, and provides an added incentive for sellers to upgrade their homes.

4. **Establishing a rate assistance program for low-income households:** This program would set a threshold for electricity bills above which the cost is simply unmanageable for low-income households, and provide financial support if bills reach that level.

ENDNOTES

1. Power Advisory Report (2014). Retrieved from: http;//www.environmentaldefence.ca/PowerAdvisoryReport
2. Ontario Clean Air Alliance. (2010). *Ontario's Stranded Nuclear Debt: A Cautionary Tale*. Retrieved from http://www.cleanairalliance.org/files/nukedebt.pdf.
3. DSS Management Consultants Inc. and RWDI Air Inc. (2005). *Cost Benefit Analysis: Replacing Ontario's Coal-fired Electricity Generation*. Prepared for the Ontario Ministry of Energy. Retrieved from http://www.energy.gov.on.ca/docs/en/coal_cost_benefit_analysis_april2005.pdf.
4. Ontario Ministry of Energy. (2013). *2013 LTEP Consolidated Figures and Data Tables*. Retrieved from http://www.energy.gov.on.ca/docs/en/LTEP_2013_Consolidated_Figures_and_Data_Tables.pdf.
5. Hydro Quebec. (2013). *Comparison of Electricity Prices in Major North American Cities*. Retrieved from http://www.hydroquebec.com/publications/en/comparison_prices/.
6. Ontario Clean Air Alliance. (2013). *A Seven Point Energy Plan for Premier Wynne*. Retrieved from http://cleanairalliance.org/files/seven-point-plan.pdf.
7. Ontario Power Authority. (2014). *Detailed LTEP Information Breakdown. Module 4: Cost of Electricity Service*. Retrieved from http://powerauthority.on.ca/sites/default/files/planning/LTEP-2013-Module-4-Cost.ppt. Slide 48.
8. Greenpeace Canada and the Pembina Institute. (2013). *Renewable is Doable: Affordable and flexible options for Ontario's Long-term Energy Plan*. Retrieved from http://www.greenpeace.org/canada/Global/canada/report/2013/09/GPC_ENERGY_PLAN2013.pdf.
9. Ontario Power Authority. (2014). *Detailed LTEP Information Breakdown. Module 4: Cost of Electricity Service*. Retrieved from http://powerauthority.on.ca/sites/default/files/planning/LTEP-2013-Module-4-Cost.ppt. Slide 40. (note: the numbers have been converted from nominal to real 2014 dollars based on a 2 per cent annual inflation rate)
10. Ontario Ministry of the Environment. (2014) Ontario Smog Advisories: 2003-2014. Retrieved from http://www.airqualityontario.com/press/smog_advisories.php?t=1.

environmental defence

ENVIRONMENTAL DEFENCE
116 Spadina Avenue, Suite 300
Toronto, ON M5V 2K6
www.environmentaldefence.ca