



Standard Offer Contracts - the Future for Renewable Generation?

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[editor's note, by Prof. Goose] *Today we welcome the TOD:Canada team to The Oil Drum. Best of luck to you in your adventure.*

The Washington Post recently hailed Ontario's electricity sector as an innovator, claiming that Ontario "[makes clean energy pay](#)". According to the Post, "the growing chorus of cheerleaders for the program say it is an example of the kind of individual, grass-roots effort that many see as the solution to intractable problems ranging from energy shortages to global warming".

"We love the idea," said Keith Stewart, an energy specialist at World Wildlife Fund Canada. "The small stuff adds up. This model should be taken right across North America."

It sounds ideal, but, looking a little deeper, can [Ontario's draft program of Standard Offer Contracts \(PDF warning\)](#) for renewable energy - billed as "the most progressive renewable energy program in 20 years in North America" - live up to the hype? There is no lower limit on the size of project eligible to participate, but can it really encourage the proliferation of backyard generation, or farm and community scale projects, as its "cheerleaders" believe?

The Coming Electricity Challenge in Ontario

The Ontario electricity sector is facing challenging times. According to the [IESO](#), "by 2014 close to 13,000 MW of Ontario's electricity requirements will need to be met with new supply or demand-side resources". This represents a large percentage of the [total installed capacity of 31,189 MW](#) as of September 2006. Up to 80% of current generation capacity will reach the end of its design-life within the next fifteen years. As part of its plan for balancing supply and demand Ontario government set targets for renewable generation of 1350MW by 2007 and an additional 1350MW by 2010. Mild weather in 2006, unlike in 2005, has kept prices low this year, fostering even greater complacency than usual. However, the IESO has warned that a season of extreme temperatures could test the system to its limits and could result in rolling blackouts.

Requests for Proposals (RFPs) - Bidding into the Central Station Model

The initial approach sought to encourage the construction of renewable generation through a series of requests for proposals (RFPs). An RFP involves setting the quantity of new generation politically while leaving the price to the market, with the lowest bidders being chosen to build the required capacity. However, the bidding process was criticized for being cumbersome, bureaucratic and costly. Only large commercial projects in resource-rich areas were able to bid - only large, well-funded projects could afford to prepare a bid at all, and only projects in resource-rich regions would be cost-effective enough to justify a low bid that might have a chance of being

selected. This process forced renewable generation to conform to the central-station model - large generation remote from demand - to which it is not well suited, rather than encouraging the development of small-scale distributed generation.

The European Alternative - Renewable Energy Tariffs

Critics of the RFP process pointed to the [European experience \(PDF warning\)](#) with renewable tariffs - the resulting huge increase in installed renewable generation capacity and the development of a successful indigenous European renewable energy industry. Under a renewable tariff system, [the offer price is set politically and the amount of installed capacity is left to the market \(PDF warning\)](#). Offer prices vary between technologies, as some renewable energy technologies are viable at a lower price than others. Offer prices may also vary with the energy intensity of the resource to be exploited, with projects in areas of lower energy resource intensity being offered higher prices for the electricity they generate in order to ensure their viability.

The intention in many European countries is to develop their indigenous energy potential as fully as possible in order to reduce dependency on energy imports, which are becoming more expensive and are increasingly derived from exporters that Europe would rather not be so dependent upon. Eliminating dependency is not possible, but renewable energy generation is nevertheless seen as a vital component of energy security, and thus worth developing even if it is currently far more expensive than conventional alternatives. Parts of Europe are taking the long-term view that fossil fuels are likely to be less affordable, if not less available, in the future than they are now, hence investments in renewable energy generation capacity made now are likely to grow in value over time.



Self-Reliance Versus Comparative Advantage

This philosophy of deliberately developing expensive self-reliance, at least to the extent that such a thing is physically possible, is completely at odds with the rationale typically governing North American expenditure on generation capacity, namely comparative advantage. Here, great importance is generally attached to achieving the lowest price in the short-term, the assumption being that the long-term will look sufficiently like the short-term that the decision will be justifiable over the life of the investment. There seems to be little real concern over dependency on imports of fuel or electricity - either between regions or between countries - and a great deal of complacency regarding both the price and the availability of conventional supplies.

Nationally, Canada has significant fossil fuel energy sources of its own as well as reserves of uranium and hydro resources, which would explain, although not excuse, a measure of complacency with regard to energy security. However, the same cannot be said of Ontario at the

provincial level, where imports of both fuel and power have been increasingly necessary in recent years in order to keep the lights on. Growing dependency on natural gas for electricity generation is a prime concern, as is the inability of Ontario's available generation capacity to meet demand without the need for expensive imports during extremes of temperature.

Standard Offer Contracts (SOCs)

Ontario was persuaded, following the long heat wave of summer 2005 and [resulting price increases](#), to put in place a legal framework for encouraging the development of renewable generation similar to that of several Europe countries, under the name of Standard Offer Contracts (SOCs). The regulations are due to be finalized shortly.

On March 21st, Premier Dalton McGuinty and Minister of Energy Donna Cansfield announced the long-awaited introduction of Standard Offer Contracts (SOC). SOC's allow operators of wind turbines, solar panels, run-of-river hydro plants and biomass plants to connect to the provincial electricity system. Dr. David Suzuki was also present at the announcement in Cambridge, ON, congratulating the Premier for taking the North American lead in renewable energy. "Ontarians need a reliable power system that doesn't leave a legacy of economic or environmental debt," said Suzuki. "Today's announcement will revolutionize the market for clean, renewable energy in North America and lay the groundwork for a healthier, brighter future."

The assumption, expressed above by the [Ontario Sustainable Energy Association \(OSEA\)](#), is that emulating the structure of the European renewable energy program would result in emulating its success, but there are key differences between the Ontarian and European approaches. In fact in some ways, the SOC program more closely resembles the RFPs which preceded it than the European approach it was intended to resemble.

The upper size limit for project eligibility is 10MW, which may well open doors for projects unable to compete under a RFP. Importantly, however, from the perspective of the way SOC's have been presented in the media, there is no lower limit on the size of projects eligible to participate.



Renewable energy is inherently decentralized, and small-scale investment in renewable technologies needs to be encouraged for its true potential to be realized. Farmers, co-operatives, communities and first-nations groups are ideally placed to install renewable energy systems. However, SOC's are not nearly as good a deal for very small generators as their proponents have

No Lower Limit?

The OPA initially considered setting a lower limit of 150kW, or even 500kW, for eligibility for a SOC, so as (to paraphrase the OPA's March 2006 report) not to inflict too great an administrative burden on itself or on the utilities in having to deal with many small applicants. This position is not indicative of an organization that is in any way committed to encouraging small-scale distributed generation, despite the green image the Ontario government is keen to cultivate.

It was instead decided to allow project economics to drive a reasonable floor, in other words to allow small potential applicants to discover for themselves - quite likely after having made the renewable energy investment - that the costs associated with a SOC are prohibitive at small scale. These generators, who will probably end up net metering, will not get the return they had been led to believe they would receive by the publicity materials.

The OPA knows projects at residential scale, and perhaps at farm or community scale as well, will not be economically viable under a SOC. The following appears on their website ([question 5](#)):

It sounds expensive, especially for very small generators. Can you make money?

The OPA does not believe that very small, residential scale projects will make a profit under the Standard Offer Program. Residential scale generators are welcome to participate in the Standard Offer Program.

Homeowners may be motivated by reasons other than making a profit. The Standard Offer Program was designed to reduce the barriers small generators were facing in the competitive bidding processes that were previously available. It is up to each project to satisfy its own decision criteria.

In some cases, particularly the very small projects, another program—called Net Metering—might be a more satisfying way to get involved.

SOCs Versus Net Metering

The article in the Washington Post promulgates a major misconception:

In addition to getting paid for making electricity, homeowners and businesses slash their own electricity draw from the grid, where power sells at an average of about 5.8 cents a kilowatt hour across the province.

This is completely untrue. The author has confused SOC's with net metering, which has been available in Ontario for some time. Under a net metering agreement, small generators can net off the electricity they produce from their consumption and pay only for the difference, if their consumption is greater than their production. If their production is greater in a given month, they may carry credit forward for up to a year, allowing their production and consumption to be netted out over an annual cycle. If their production exceeds consumption over the year, however, the utility will not pay for the surplus.

In contrast, under an SOC production is completely separate from consumption - the two are metered and handled independently. All production is compensated at the rate established in the SOC - 42 cents per kWh for solar photovoltaic generation and 11 cents per kWh for everything else - while consumption is charged for at the prevailing rate set by the province. One cannot both

be paid for electricity produced under a SOC and watch one's meter run backwards - it will be one or the other. For most small generators, net metering is likely to be the more attractive option as the costs they would be expected to bear under a SOC are likely to prove to be prohibitive.

Fixed Costs and Fixed Prices Under a SOC

All generators under a SOC are required to have an Ontario Energy Board generator licence, at a cost of \$100. They must also have a four quadrant meter with telecommunications capability in order to transmit the hourly data. The cost of the meter is likely to be between \$1000-3000 and a dedicated phone line may well be required. In addition, generators must maintain separate utility accounts for generation and load, at additional cost. All connection costs, including a connection impact assessment and any upgrades to the distribution system required as a result of the connection, must also be carried by the generator.

Solar installations will be paid 42 cents per kWh and all other generation technologies will receive 11 cents per kWh, with prices to be fixed for the 20 years of the contract. An inflation adjustment is available for 20% of the price paid to non-solar installations, while solar generators will receive no inflation adjustment at all. The price could therefore vary significantly in real terms over the life of the contract.

A premium of 3.52 cents per kWh is available to non-intermittent generation, only if it can guarantee that power would be supplied to the grid for at least 80% of on-peak hours under normal circumstances. A costly assessment would have to be undertaken by the generator in order to establish this capability. Given that the definition of peak hours is subject to seasonal variation and also to change without notice, this could be difficult to prove and to design for. Wind and solar are automatically excluded from this upgrade, even if twinned with small hydro or energy storage in order to provide dispatchability.

Costs Versus Benefits for Small Generators

Even in today's terms, the price offered for non-solar generation is not particularly generous in comparison with the spot price for electricity, especially during peak seasons. It is approximately double the regulated price paid by electricity consumers, but the regulated price is itself effectively subsidized. During peak demand periods the spot price regularly exceeds 11 cents per kWh - in fact in the summer of 2005 there were entire weeks when the spot price averaged over 15 cents per kWh. Seen in this context, the SOC payments for non-solar generation hardly represent a premium, even without taking into account all the costs to be imposed on small generators. This is perhaps not surprising since the Ontario Power Authority (OPA) set the 11 cents per kWh rate by reference to the rates offered under the previous RPF system, which pertained to large commercial projects.

The payments for solar PV, which might seem generous at first glance, are not attractive for small generators. For instance, a homeowner with a typical 1.5kW system could conservatively expect to generate approximately 1500-1800kWh per year in Ontario (depending on whether or not the angle of the panels is fixed or optimized by season). That is equivalent to about 125-150kWh per month. At 42 cents per kWh, that would be worth \$52.50-\$63 per month.

To put that in perspective, the cost a dedicated phone line, which would probably be required under a SOC, could reach \$40 per month. Added to the \$10-30 cost of maintaining a separate utility account as a generator, and the capital cost of the required interval meter costs - \$1000-3000 - it is clear that generators at a household scale would be lucky not to make a net monthly loss. It would be unlikely that the generator would even recoup the cost of the meter over the life of the contract, let alone the cost of the system. Needless to say, the numbers look even worse for small generators using any generation technology other than solar PV.

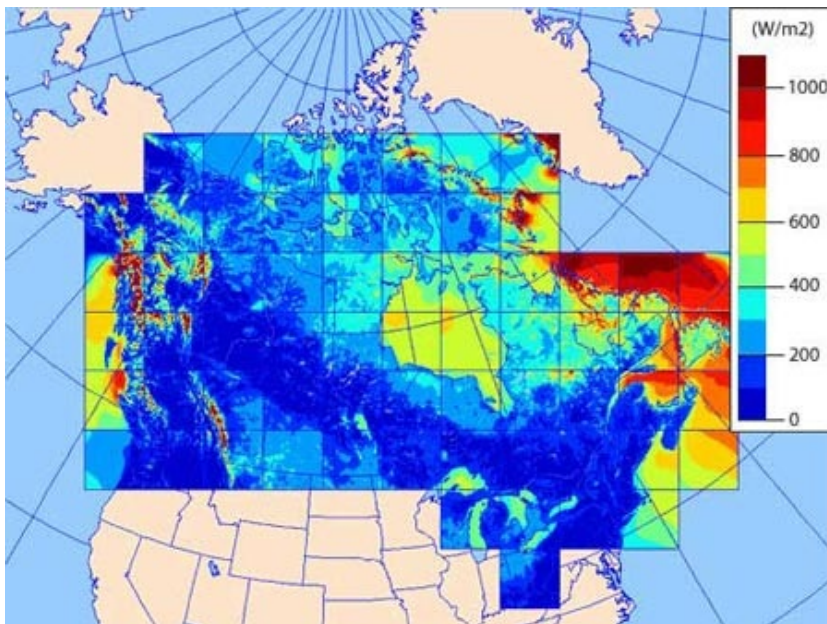
According to the Washington Post article:

Advocates like Deborah Doncaster, executive director of the Ontario Sustainable Energy Association, say they want to get the program started and expect that the power authority will increase the prices later.

However, any changes to SOC prices would not be retroactive and so would only apply to contracts established subsequent to the change. The OPA explicitly said during a teleconference on September 15th, that the price paid to solar installations was not intended to provide a return on investment. In addition they said that any adjustments to the price would reflect only changes in the cost of the technology. They specifically ruled out changing the price in the future in order to provide a better return on investment.

Common Pricing, Variable Costs

The common price of 11 cents per kWh for non-solar generation will result in very different rates of return for various classes of renewable energy projects as the cost structure for different technologies is ignored. The assumption built into this model is that all renewable energy, with the exception of solar PV, is of the same value to the Ontario ratepayer and so should be similarly compensated in order that the cheapest technology in the most resource-rich location would be favoured. It would be considered irrelevant, in terms of value to ratepayers, if this provision were to result in only one form of renewable energy being taken up under the SOC program, or if SOC generators were concentrated only in certain resource-rich areas. This philosophy - the pursuit of comparative advantage - is exactly the same as that underlying the RFP program which preceded it. It is, however, completely at odds with the basis of the European renewable tariff system, the success of which the SOC program was meant to emulate.



Map: windatlas.ca

Some technologies, for instance the biogas digesters currently being considered by many farmers, would not be viable at all under such a pricing regime. The equipment would not last for the 20 years of the contract and the rate offered is too low to allow for equipment replacement. The common pricing system would heavily favour wind projects in areas of high wind energy density at the expense of almost everything else, which is bound to lead to disappointment given the expectations that have been created. Of particular relevance to farmers, who have been keen proponents of a SOC program, is the tax provision that dictates that if farmland is used for the purpose of electricity generation to be sold to the grid, then the taxes for the affected land will

shift from farmland rates to industrial rates. It is not clear that farmers are yet aware that they should have grounds for concern.

Incentives and Credits

Renewable energy often benefits from various incentive programs, which may comprise an essential element of their financing. Under the SOC program, any incentive payments which a project may be eligible for will accrue to the OPA and not to the generator. The OPA also retains, "for the benefit of Ontario consumers", the rights to any emissions credits resulting from avoided emissions of greenhouse gases by a SOC project. This provision could jeopardize the viability of renewable energy projects, and could potentially cause external sources of funding to dry up rather than to contribute to the budget of the OPA.

Backup Power?

SOCs encourage those who invest in renewable energy infrastructure to put in a grid-tie and sell all their output through the grid in exchange for payment. However, should the electricity supply system become less reliable than it is now - perhaps due to fuel shortages courtesy of peak natural gas, unfavourable hydrological conditions due to global warming or reliability issues at aging nuclear installations - the owners of those renewable energy systems will still suffer blackouts like the rest of the population. Under outage conditions, a grid-tied system with no capacity for power storage will not function - no power will be paid for and no power will be available to the owner of the system. Energy storage systems can be expensive, but can allow the small generator maximum flexibility as to the use of his output. If he cannot be paid due to an outage, he can use the power himself to run his essential loads.

Value for Ontario Ratepayers?

According to the OPA, the SOC program has been designed "to promote renewable energy generation projects that are of value to the Ontario ratepayer", not "to have Ontario electricity consumers and taxpayers subsidize any and all renewable energy projects regardless of their value to the system". As the cost of participation is entirely disproportionate for small generators, the message sent to these generators is that their participation is not of value to Ontario ratepayers, even in aggregate.

Unfortunately for the Ontario government, there may be a political price to pay for having led homeowners, farmers and small co-operatives to believe that they would be offered a favourable deal under a SOC. For instance, according to the Canadian Solar Industries Association (CANSIA), there has been a 400% increase in sales in the last year since the SOC program was announced, which represents a lot of raised expectations.

In Ontario, the program has already brought a rush of activity. Homeowners in Toronto are climbing onto roofs to add solar panels. A cooperative of small investors is raising money to build five large wind turbines to harness Lake Huron winds. Others are eyeing the locks of a St. Lawrence Seaway canal for small hydro-turbines. Farmers are looking at manure piles and figuring the profits of using organic decomposition to create methane gas that can make electricity. "There's a tremendous interest, at all levels, from well-organized business consortiums to small homeowners," said Tim Taylor, a spokesman for the Ontario Power Authority. "The impact in megawatts is going to come from the larger projects, but there's a tremendous momentum found in small, backyard projects."

The following response, quoted in the Washington Post, from a Toronto homeowner with newly installed solar panels on his roof, is typical:

I think the government has underestimated the amount of response it was going to get," he said. "What other kind of home improvement gives you dollars in return?"

He and many others who have invested in renewable energy technologies, or have sunk time and money into attempting to make such an investment, are likely to be very disappointed, if not very angry.



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