Council for Clean & Reliable Electricity
transforming the way we think about power

OCTOBER 2011

Commentary

Keeping the Baby, Throwing out the Bathwater

JAN CARR

keep the baby– small-scale generation projects, throw out the bathwater– subsidies and prescriptions

A Distributed Generation Tariff (DGT) program to replace Ontario's existing Feed-in Tariff (FIT) would have several benefits. For example, a DGT would play a useful role in facilitating the development of a wide range of innovative, small-scale electricity generating projects to help meet the province's growing electricity demand. As such, it would have a positive environmental impact, reducing the province's footprint through localized use of renewable energy and energy resources that are now being wasted.

These DGT benefits have been explored in an earlier companion paper (Carr, 2011) that argues for transforming the current FIT program into a DGT, rather than eliminating it in response to growing concerns that it will result in higher electricity prices. This paper outlines some of the features required in a FIT redesigned to become a DGT so that consumers' needs are better met and a wider range of cost-effective, small-scale projects are integrated into the electricity supply. The goal is to keep the baby—small-scale generation projects that create value—and throw out the bathwater, the subsidies and prescriptions that encumber FIT.

CONCEPT AND PROBLEMS

Both a FIT and a DGT are standardized arrangements that define the terms, conditions and prices under which a utility system will accept electricity from independently owned generators. The "tariff" in their names implies non-negotiable standard terms and pricing under which a generator delivers to the electricity system, similar to the way most consumers buy from it.

Without such standardized arrangements, generators who are independent of the electric utility would arrange individual pricing and contract terms. Traditionally, these terms and prices would be established through a competitive marketplace with the generator selected on the basis of price and performance obligations that best meet consumers' needs.

In electricity, as for other products and services, competition ensures that producers' prices reflect economic value and that innovation occurs. So removing competitive pressure from suppliers through standardized tariff arrangements exposes customers to potentially higher prices. Therefore, customer protection should be central in the design of the new DGT.

This can be achieved by organizing the tariff around the buying of electricity rather than incenting investment in generation. And that, in turn, means that unlike Ontario's current FIT, the DGT would no longer be a mechanism for delivering subsidies to generators.

DELIVERING SUBSIDIES

A DGT system does not necessarily imply the complete elimination of subsidies but rather that they are delivered by means that do not distort electricity prices. The arguments in favour of separating subsidies from electricity pricing in a standardized tariff program and the question of how best to deliver them deserve a more detailed economic analysis than the intuition offered here. While several studies have shown subsidies delivered through electricity pricing are not cost effective (e.g., Frondel et al, 2009), nobody seems to have compared their efficacy to more traditional subsidy mechanisms such as tax incentives, grants or loan guarantees.

The primary objective of Ontario's current FIT program appears to be creating employment in the renewable energy sector (Ministry of Energy and Infrastructure, 2009). Government programs with such broad economic objectives are typically funded from general tax revenues, either through grants or tax incentives. These arrangements have evolved through long experience with economic-stimulus and industrial-policy initiatives to balance the cost burden across society, recognizing both the ability to pay and the allocation of benefits. In comparison, putting surcharges on electricity sales to fund subsidies for selected types of generation has a high probability of unfairly and uneconomically allocating costs and benefits.

funding subsidies for selected generators through electricity surcharges allocates costs and benefits uneconomically

TECHNOLOGY NEUTRAL

The subsidies built into Ontario's current FIT program result in a range of prices for different generation technologies – wind, solar, hydro – and subcategories such as ground-mounted and roof-mounted solar. Since each price category requires separate design and applicability rules, and since compliance with these rules requires policing, program administration becomes a significant bottleneck and cost. Technology-specific pricing also stunts innovation, as the list of eligible technologies will always lag new developments.

Eliminating distinctions among different types of generators and making the DGT technology neutral would result in a single buying price for electricity.[1] Such an approach would at once simplify administration and allow the selection among different types of generation to be driven by economics and innovation.

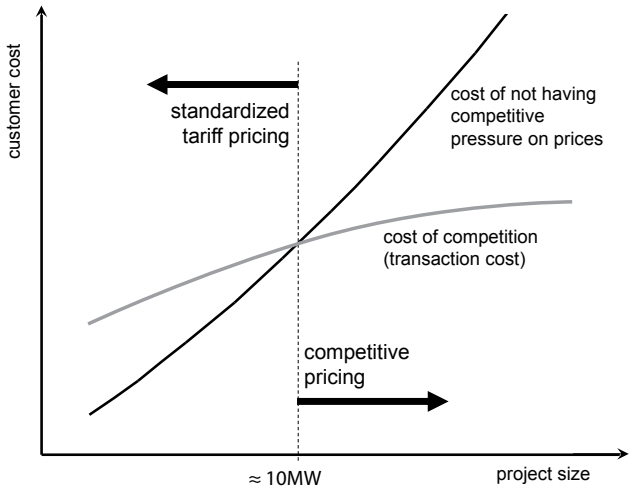
MAXIMUM PROJECT SIZE

As outlined in the companion paper (Carr, 2011), eliminating a competitive procurement process reduces the consequent "transaction cost" of a fixed-tariff program. Assuming that pricing is set appropriately, as described later, savings in transaction costs find their way back to consumers along with the savings the procurement entity – in Ontario's case, the Ontario Power Authority (OPA) – makes from not needing to run a competitive process.

[1] The price could have hourly variations and depend on whether the supplier or the electricity system operator has the choice of when the generator operates. The price is "single" only in the sense that all suppliers of the same product delivered at the same time receive the same price, regardless of the type of generator involved.

Economy of scale results in transaction costs being a higher proportion of total project cost for small projects than for large projects. But the potential for savings through competition based on prices grows with project cost and, therefore, project size. As illustrated in Figure 1, at a certain project size the transaction savings under a standardized tariff program more or less balance the cost reduction foregone by eliminating competition. Below that project size, both consumers and suppliers win. Above that size, suppliers win while consumers lose. This would suggest that an economically rational standardized tariff program should have a maximum size limit on individual projects.[2]

Figure 1 – Project Size and Preferred Pricing Method



Source: Author's Drawing

The concept of maximum project size does not lend itself to selecting a precise limit. The original Standard Offer Program in Ontario limited all projects to 10 megawatts (MW) and British Columbia has recently adopted 15 MW. However, the 10 MW limit is more in keeping with the maximum capability of many local electricity distribution systems (Sturton, Otal and Carr, 1994).

the bulk of required investment in new generation would occur through competitive procurement

By limiting the size of individual projects and delivering any subsidies by other means, the DGT program would account for only a small part of the total electricity requirements of Ontario consumers. The bulk of required investment in new generation would occur under a parallel competitive procurement process, much as before the FIT was introduced. This is an important distinction between the proposed DGT and the current FIT program, and opens up new options for establishing prices and administration.

PRICING AND CONTRACT TERM

A DGT contract framework could be structured like a true electricity tariff with a price that is revised periodically and a perpetual contract term. This parallels how the majority of electricity customers in Ontario buy electricity. Carrying the analogy further, the pricing could be set by the Ontario Energy Board (OEB) in a process similar to its retail Regulated Price Plan (RPP). This RPP process is based on estimating the total cost of electricity to be consumed over the next six-month period based on previous operational history and the prices specified for all the regulated and contracted generation resources. The price paid by consumers is then set to recover that cost over the volume of sales expected and is shaped with differentials for volume tiers and time-of-use.

[2] One indication of the economic irrationality of Ontario's FIT program is that there are no restrictions on maximum size for most technologies (except hydro 50MW and a per property limit of 10 MW for ground mounted solar which appear to relate more to land and resource use considerations than to electricity economics) although project size may affect the price category assigned.

With such a price-setting arrangement, customers' interests under a DGT would be protected because price would track long-term trends of the conventional generating fleet supplying the major part of customers' electricity requirements. As well, both transparency and confidence would be enhanced by making DGT pricing the responsibility of a regulator with a long-established mandate in the energy sector of balancing the needs of suppliers with the wants of consumers.

With regulatory protection in place, customers would realize no benefit from limiting the term of DGT contracts since the contracts need not bind generators to producing electricity and contributing to supply reliability.[3] It would therefore be possible to treat the DGT program as a true tariff by making it available in perpetuity in the same way that electricity customers have the perpetual right to buy electricity.[4]

INVESTOR CONFIDENCE AND THE SOURCES OF RISK

investors might have greater confidence in a perpetual DGT contract that incorporates a periodic transparent price-setting process

Generation developers might worry that twice-yearly rate reviews would make lenders less likely to advance funds because they lacked an assured revenue stream. However, investment opportunities in the broader economy receive funding from lenders without any such assurance. Indeed, in the Canadian electricity sector Alberta has a healthy level of new investment in generation, including in wind and other renewables, without such guarantees.[5]

But lenders in Ontario do face considerable risks from frequent and unpredictable changes to electricity policy. Recent research shows that policy instability[6] can more than offset the benefits of Ontario's generous subsidies in the eyes of investors in renewable electricity (Holburn, Lui and Morand, 2010).

Investor confidence is undoubtedly further eroded by the "black box" nature of Ontario's current FIT program, whereby pricing and eligibility are subject to direct government control. Prospective investors might view with greater confidence a perpetual DGT contract that incorporates a periodic transparent price-setting process by an independent regulatory agency than a FIT contract that guarantees prices over 20 years but is subject to the whims of government.

---

[3] If the DGT program covers only small-scale facilities, overall electricity supply reliability will be insignificantly affected by whether a particular generator is operating or not. It will, therefore, be administratively simpler to not impose production or availability obligations on the generator. Appropriate operational behaviour could be incented through either time-of-use rates or optionality pricing when changing from self-dispatch to dispatch directed by the system operator.

[4] Since the tariff would be established by the OEB, whose processes and decisions are subject to law, "perpetual" in this context means "a long time." In practice, tariffs continually evolve and are adjusted through the routine regulatory process. In this way, they avoid falling out of step with the times, which might trigger sudden and more arbitrary changes to prices and conditions.

[5] Alberta has just over 12,000 MW of generation in operation and a further 16,753 MW of new investment either under construction (991 MW), approved for construction (2,597 MW) or announced to be constructed (13,165 MW). Of this, 7,045 MW, about 40 per cent, is in renewable generation – mostly wind but also biomass and hydro. (Alberta Electric System Operator. "Long Term Adequacy Metrics." May 2011.) While it is unlikely that all the announced generation will proceed to construction, the investment level in projects that are already under construction or construction-ready with approvals in place has historically been about one-third of the size of the system's total generation capacity, leaving a comfortable margin to cover both system growth and possible declines in investment levels.

[6] In the last two decades, there have been 16 Ontario energy ministers, serving an average tenure of about 16 months. The number drops to 14 if people rather than ministers are counted since two people held the appointment twice on separate occasions. Either way, this exceeds or equals the ministerial turnover in all other Ontario ministries, which averages less than eight ministers since 1990, or about 33 months each. (G.P. Murray Research Ltd. "Ontario Ministerial Turnover." December 2010)

CONCLUSIONS

The proposed DGT program should be technology neutral and have prices set periodically through a formal regulatory process. It should also be a standing program, open for use by any qualifying generator at any time and with no contractual time limit. As such, its administration would be greatly simplified compared to the present FIT program.

In the same way as electricity customers can now deal with their local utility in arranging for supply, a DGT program would allow the OPA's centralized administration to give way to distributed administration by local utilities. It is these utilities that in any case would have to arrange for system connections for DGT generators since they would all be small scale.[7]

While it will make just a minor contribution to overall electricity supply, a DGT program will benefit consumers and communities, to say nothing of the environment, by facilitating worthwhile small-scale generating projects.

centralized administration could be replaced with distributed administration by local utilities

REFERENCES

Carr, Jan. 2011. "There's a Baby in the Bathwater." Council for Clean and Reliable Electricity Commentary. September.

Frondel, Manuel, et al. 2009. "Economic Impacts from the Promotion of Renewable Energy Technologies: The German Experience." Ruhr Economic Papers. November.

Holburn, Guy, Kerri Lui and Charles Morand. 2010. "Policy Risk and Private Investment in Ontario's Wind Power Sector." Canadian Public Policy. 36(4): 465-486.

Ministry of Energy and Infrastructure. 2009. "Ontario Legislature Passes Green Energy Act." Government of Ontario News Release. May 14.

Sturton, Andy, Otal, Shawn and Carr, Jan 1994. "Connecting Small Generators to Utility Distribution Systems." Report 128D767. Canadian Electricity Association. Montreal. June.

[7] If the required connection capacity is sufficiently low, it will be cheaper to connect to a (low-voltage) distribution system than a (high-voltage) transmission system since the cost of grid connection equipment rises with voltage level.

Council for Clean & Reliable Electricity
transforming the way we think about power

THE AUTHOR

Jan Carr is now retired but was CEO of the Ontario Power Authority (2005-2008) and a Vice Chair of the Ontario Energy Board (2004). He holds degrees in electrical engineering including a Ph.D. (1972) which specialized in electric power systems. As both a consultant and a corporate director he has advised governments, corporations and stakeholders on technical, business and policy matters related to electricity. He has been awarded a medal for management by the Ontario Professional Engineers (2007) and an honorary degree by the University of Waterloo (2010).

Declaration of Interest

The author is a director of both Guelph Hydro Inc. and Navitus Plasma Inc. Both companies have business plans which include selling electricity into the Ontario grid under a feed in tariff.

The Council for Clean & Reliable Electricity

The Council is a federally incorporated non-profit organization that was formed to provide a platform for open public dialogue and a solutions-oriented approach to the challenges of the energy sector. It is a forum where representatives from universities, public and private sector business leaders, and strategic planning professionals collaborate to broaden the public debate on energy issues. The Council has organized conferences on distributed generation, biomass, coal, nuclear and public sector governance in the electricity sector.

---

www.thinkingpower.ca