

# “Feed-in” tariffs in Ontario: UnFIT energy policy



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With the 2009 passing of the *Green Energy and Green Economy Act*<sup>1</sup>, intended to build a “green” economy, the Government of Ontario began the implementation of a feed-in tariff (FIT) program (OPA, 2010a) to subsidize the generation of electricity from renewable sources, such as wind, hydro, etc. Ontario Premier Dalton McGuinty has justified the FIT program as a way to stimulate the lagging Ontario economy through the creation of green jobs (McGuinty, 2010). The Ontario Ministry of Energy and Infrastructure (OMEI) claims that the subsidy program “will help Ontario to phase out coal-fired electricity by the end of 2014—the single largest climate change initiative in North America” (OMEI, 2010a). Environmental groups have also argued that subsidized investment in renewable energy generation will reduce local air pollution (Environmental Defence, 2010). However, evidence suggests that these justifications are flawed, and that the FIT program will result in increased government debt in order to avoid a political backlash from citizens burdened with large increases to their electricity bills.

A feed-in tariff is a guarantee from the government that any power generated from a government-approved, renewable-energy project will be purchased by local utilities at a fixed price that is above market value over a set time interval. FIT programs have been implemented

by several European nations since the 1990s (Couture et al., 2010). A feed-in tariff encourages investment by private firms in renewable energy projects by providing a subsidized price above market value for electricity, and by shifting the risk associated with price uncertainty away from investors. The FIT price offered by the Ontario government varies depending on the source of renewable energy and a detailed breakdown is provided by the Ontario Power Authority (OPA, 2010b). In the context of FIT, the government pays a price to FIT project owners calculated through each kilowatt hour (kWh) of electricity produced. The lowest FIT prices for each renewable source are \$0.135/kWh for wind, \$0.122/kWh for hydro, \$0.443/kWh for solar, and \$0.147/kWh for bioenergy projects less than 10 mW.<sup>2</sup> By the second quarter of 2010, the Ontario Power Authority had approved “598 Feed-in Tariff contracts with a combined capacity of approximately 1,994 mW” (OPA, 2010c: 2). For perspective, the approved FIT projects would account for approximately just 5% of current generating capacity—the maximum combined output of all generation facilities—in Ontario.<sup>3</sup> The addition of the FIT projects to current capacity would increase renewable generation (including hydro) to around 30% of total capacity (the remaining capacity would be 31% nuclear, 26% natural gas, and 12% coal) (IESO, 2010; author’s

**Table 1: Costs of greenhouse gas (GHG) reductions**

Energy source	GHG intensity (g CO <sub>2</sub> e/kWh)	Cost (\$/t CO <sub>2</sub> e)
Wind	10	91.20
Hydroelectric	10	86.91
Biogas	11	160.95
Solar PV	32	819.66
Natural gas with carbon offsets	0	27.00

Sources: EIA, 2010; OPA, 2010b, Navigant Consulting, 2007; Sovacool, 2010; calculations by author.

calculations). Over 50% of the approved FIT capacity is from wind, over 25% from solar, 10% from hydro, and only 1% from bioenergy. The approval of FIT projects is ongoing, thus renewable energy is expected to account for an even greater percentage of total generating capacity.

The current structure of the Ontario electricity system suggests households and small businesses will bear the cost of the FIT program if the current pricing system remains intact. In Ontario, households and small businesses purchase electricity from local utilities at fixed prices set by a branch of the Ontario government, the Ontario Energy Board (OEB),<sup>4</sup> whereas large businesses participate in the wholesale energy market in which market prices equal to, or greater than, the lowest FIT prices occur less than 3% of the time (Navigant Consulting, 2010). Therefore, the owners of FIT projects will rarely choose to sell electricity in the wholesale market if they can sell to the local utilities at the prescribed FIT prices. The cost of the electricity purchased by the local utilities is essentially averaged across energy sources to calculate the fixed prices set by the OEB. Thus, the OEB fixed prices will also include the cost of the FIT program. Furthermore, the FIT subsidy will be paid for by households and small businesses who will experience increased fixed prices, as the current OEB fixed prices are much lower than the FIT prices. Forecasts in *Ontario's Long Term Energy Plan* predict that the fixed prices will increase about 46% over the next 5 years, with 56% of that increase attributable to investment in renewable energy (OMEI, 2010b:59). However, in November 2010, the Ontario government announced its intention to intervene to prevent these large increases in household electricity bills (Howlett and Radwanski, 2010). The government proposed the *Ontario Clean Energy Benefit*, which is a 10% rebate on household electricity bills (Duncan, 2010). The problem

is that the proposed rebate will be funded by further government borrowing that will then put the Ontario government in the perverse position of subsidizing both the consumption, and the production, of electricity.

The possibly well-intentioned, yet misguided, justifications for implementing the FIT program have been to stimulate the economy by creating jobs, reduce local air pollution, and reduce greenhouse gas (GHG) emissions. To address the first, stimulating the economy through government spending and government-funded investment (e.g., the *Infrastructure Stimulus Fund*)<sup>5</sup> has been ineffective in Canada (Karabegović et al., 2010) and elsewhere. For example, a study entitled *Study of the Effects on Employment of Public Aid to Renewable Energy Sources* estimates that 2.2 jobs are displaced in the Spanish economy by every renewable energy job created through public subsidies (Alvarez et al., 2009). The evidence suggests that government-subsidized investments in renewable energy infrastructure will actually not be good for employment and/or economic growth in Ontario.

As to reducing air pollution, Ontario already regulates the emission of air pollutants by large emitters—such as electricity generation plants—through various regulatory mechanisms that account for local air quality. Furthermore, ambient concentrations of major air pollutants have decreased substantially in Ontario over the past 35 years (McKittrick, 2008). Electricity generation in Ontario accounts for 24% of sulfur dioxide emissions and only 10% of nitrogen oxide emissions (OME, 2010), but according to the Environmental Protection Agency, natural gas-fired electricity generation produces negligible sulfur dioxide and mercury emissions, and less than a third of the nitrogen oxide emissions of coal-fired generation (EPA, 2010). Therefore, replacing coal-fired generators with natural gas-fired generators, instead of renewable energy projects, would still result

in the reduction of sulfur dioxide and mercury emissions from electricity generation to almost zero. It would also cause large reductions in nitrogen oxide emissions. The improvements to air quality attributed to the FIT program come not from renewable energy itself, but actually from the planned closure of coal-fired generators. Similar improvements could be achieved through investment in natural gas or nuclear energy, instead of costly renewable energy.

Finally, then, the one valid justification for the FIT program is the claim that renewable energy has extremely low emissions of GHG in comparison to all other electricity sources (Sovacool, 2008). However, it is important to evaluate the cost of these GHG reductions compared to an alternative source of electricity, such as electricity generated by using natural gas. Electricity production cost estimates<sup>6</sup> for natural gas generation are between \$0.11/kWh when producing 20% of the time and \$0.08/kWh when producing 80% of the time (OPA, 2007). Unlike the FIT prices, the costs of gas-fired generation are very low. Electricity generation using natural gas also avoids the intermittency problems associated with wind and solar energy (e.g., the inconsistency of wind patterns and cloud cover), and can run much more regularly if needed—up to 87% of the time versus 34.4% for solar energy and 21.7% for wind energy (EIA, 2010). Table 1 presents estimates of GHG emissions per kWh and the cost of GHG reductions (relative to natural gas electricity generation). The cost of GHG reductions can be estimated using the FIT prices, the cost of gas fired generation, and lifecycle emission estimates. Of the renewable energy sources, hydro generation has the lowest cost of reducing GHG emissions at \$86.91 per tonne of GHG avoided, whereas reducing GHG emissions through wind power costs \$91.20 per tonne of GHG avoided, and Biogas costs \$160.95 per tonne of GHG avoided. Reductions through solar energy are substantially more expensive than the other technologies at an astounding \$819.66 per tonne of GHG avoided. For perspective, the average price to offset a tonne of GHG through eight major Canadian carbon offset companies is around \$27 per tonne of GHG. Thus, it would be much



cheaper to rely on electricity from natural gas and achieve GHG reductions through purchasing carbon offsets (Table 1). If we include the cost of the carbon offsets, the generation costs for electricity generated from natural gas would be \$0.09/kWh, which is much lower than any of the guaranteed FIT prices. If the only achievable purpose of the FIT program is to reduce GHG emissions, it is an extremely expensive way of doing so.

Overall, the FIT program is not the least costly way to meet the economic and environmental goals of the Ontario government, nor is it good public policy for Ontario. Other Canadian provinces contemplating implementing feed-in tariff programs should seriously reconsider their policy options.

## Notes

1 The *Green Energy and Green Economy Act*, also known as Bill150, repealed the *Energy Conservation Leadership Act* and the *Energy Efficiency Act*. Among many other things, the *Green Energy Act* will allow the province to require vendors of real estate to provide energy efficiency information and possibly an energy audit.

2 mW = megawatt, kW = kilowatt, and 1mW = 1000kW.

3 Based on current generating capacity of 35,781 mW (IESO, 2010).

4 See OEB, 2009 and 2010 for detailed information on OEB pricing. The former is a simple overview, and the latter is more technical. For a thorough discussion of various inefficiencies caused by OEB pricing, see Dewees, 2010.

5 The *Infrastructure Stimulus Fund* provides funding to provincial, territorial and municipal construction-ready infrastructure rehabilitation projects. Funding is available for two years for projects that begin during the 2009 and 2010 construction seasons. For more details, see <http://www.actionplan.gc.ca/initiatives/eng/index.asp?mode=2&initiativeID=116>

6 Electricity cost estimates are of the levelized cost of electricity (LCOE) and represent the present value average price per kWh required over a project's operational life to cover all project costs (construction, operating, maintenance, fuel, etc.). LCOE is used by analysts to compare costs of electricity generation between energy different sources.

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