Leaving the Lights on for Community Involvement in Renewable Energy: Devising a Legal Framework for Feed-in Tariffs to Promote Community Investment in Renewables

Anton Tabuns

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Signature of Student (Anton Tabuns):

Signature of the Major Paper Supervisor (Mark Winfield):

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Foreword

The MRP fulfils the learning objectives of the Plan of Study (POS) by directly addressing all three objectives. The MRP's focus on renewable energy and community power initiatives addresses the POS's first learning objective by proposing methods on how to further renewable initiatives as well as addressing the political, legal and business considerations that are essential to the implementation of sustainable energy and exploring some of the more technical aspects of renewable energy.

The paper fulfills the second learning objective of the POS by acknowledging the consequences of climate change and explains why sustainable energy can be an effective mitigation strategy for the phenomenon.

The third learning objective makes up an integral part of the MRP as the focus of the paper, and the learning objective, is how law can be used to create legislative frameworks that will aid the growth of renewable energy and what particular legislative amendments can be used to influence different actor's involvement in the renewable energy sector.

Abstract

This paper examines how a community-based renewable power industry can be established in Ontario. The paper explores feed-in tariff (FIT) regimes as a means of sparking renewable energy development and the place that community power can attain with the aid of a successful FIT scheme. The paper's main focus will be to explore and compare the FIT regimes in the three European nations with Ontario's FIT scheme and to suggest how Ontario's system can be amended to further greater investment on the part of community power actors.

1. Introduction

a) Climate Change

Scientists have reached a broad consensus that climate change does exist and that its effects are, and will continue to be, detrimental to humanity. The United Nations Framework Convention on Climate Change (UNFCC) defines climate change as: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable periods" ("United Nations Framework Convention on Climate Change," 1992, p. 3). The goal of the UNFCC mitigation strategy is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" ("United Nations Framework Convention on Climate Change," 1992, p. 4). The Intergovernmental Panel on Climate Change (IPCC) 2007 report on climate change acknowledges that defining "dangerous anthropogenic interference with the climate system" is difficult because it involves a series of value judgements (this has been the subject of some discussion – see Dessai, Adger & Hulme et al, 2004); Schneider, 2001). The IPCC suggests that interference with "key" systems such as: "food supply, infrastructure, health, water resources, coastal systems, ecosystems, global biochemical cycles, ice sheets and modes of oceanic and atmospheric circulation" might constitute "dangerous interference" (Intergovernmental Panel on Climate Change, 2007, p. 18). While a discussion of the exact meaning of "dangerous anthropogenic interference" or "dangerous climate change", as it has also been referred to, is undoubtedly worthwhile, it is beyond the scope of this paper. The goal of the paper is to explore one possibility to aid in the mitigation of dangerous climate change.

b) Renewable Energy as a Viable Means of Mitigating Dangerous Climate Change

The international scientific community has agreed that the introduction of carbon-free renewable energy sources is one essential strategy for mitigating climate change (Fisher, B.S., et al., 2007, p. 218). Energy supply accounts for 25.9% of GHG emissions globally, and most of these emissions are due to the use of fossil fuel, in various forms, for energy (Intergovernmental Panel on Climate Change, 2007). However, fossil fuel use is not restricted to energy supply but extends to almost all sectors of the modern economy, from transportation to manufacturing to agriculture. The utilization of fossil fuels not only affects the climate but creates a massive environmental disturbance beginning with its production and continuing through to the consumption of its by-products and the concomitant pollution of the water and air (Scheer, 2007, p. 20). Fossil energy use is one of the greatest reasons for the growing threat of dangerous anthropogenic climate change and a shift away from the use of such fuels must play a part in mitigating that threat (Scheer, 2007, p. 14). There are various ways to reduce humanity's dependence on fossil fuel use, such as decreasing overall energy use through energy efficiency measures, but finding other energy sources will be essential.

Renewable energy generation, the generation of power through non-carbon emitting means is defined, for the purposes of Ontario's *Green Energy and Green Economy Act, 2009* (Green Energy Act/GEA) and this paper as: energy "that is renewed by natural processes and includes wind, water, biomass, biogas, biofuels, solar energy, geothermal energy, [and] tidal forces" (*Electricity Act, 1998*, 1998). It should be noted that while the IPCC has endorsed greater renewable energy as an appropriate mitigation strategy, renewables are not without their detractors. Opponents of renewable energy claim that it would not be possible to construct enough solar or wind (or put in place adequate conservation measures) to ever stop reliance on fossil fuels. Some advocates of

nuclear power advance similar arguments, maintaining that nuclear is the only viable alternative to fossil fuels and, again, that alternative energy sources could not generate enough power to maintain the system (AECL, 2006).

The claim is also made that the costs of implementing large amounts of renewable energy are prohibitive. Proponents of conservation and renewable energy refute these claims and argue that meeting society's energy needs is achievable through sustainable methods and that nuclear and fossil fuels now receive government subsidies which make them more affordable. It is argued that if the true price of, for example, coal, was measured using a price taking into account the health costs and other detrimental externalities carried by society in general rather than the generators of coal power, the cost of coal power would be considerably higher (Cullen, R., 1993). The government of Ontario currently provides a Public Health and Environmental Subsidy for coal-fired generation that amounts to approximately $3.1 billion, the price of coal would rise substantially without this subsidy (Gibbons, J., & Fracassi, J., 2008). Proponents also claim that renewable energy technology is improving at a rapid rate, bringing down costs and increasing the amount of power available (Scheer, 2007).

c) Policy Options for Promoting Renewables

The introduction of a policy to spur development and innovation in renewable energy technologies is important for any mitigation strategy and can work in tandem with a macro-policy such as carbon a carbon tax or cap-and-trade regime. The two main policy options for spurring renewable development, mentioned above, are FITs and a "quota" system. A quota system is used in the UK where it is known as the "renewables obligation" (RO), whereas FITs have been popularized in Germany, Spain and Denmark and involve state intervention to set prices for different types of renewable energy (as opposed to the RO system which is more dependent on

market-based procurement mechanisms). The evidence so far seems to suggest that FITs have a greater capacity to ensure the growth of renewable energy at a faster rate and lower cost than quota systems (Mendonca, M., 2007)(Toke, D., & Lauber, V., 2007). FITs "…have proven the most successful mechanism for stimulating investment in renewable electricity generation worldwide. Renewable Tariffs have resulted in more installed generating capacity…than any other policy mechanism"(Gipe, P., 2006, p. 1). As this paper is concerned with examining renewable energy as a tool to mitigate global warming, FITs, as the instrument most capable of stimulating growth in renewables, will be the policy instrument most closely examined.

d) FITs and Community Power

This paper operates on the assumption that community power, although not perfect, is the optimal arrangement when constructing renewable power and the reasons for this assumption will be detailed below and throughout the paper. For the purposes of the paper, community power will be defined as an installation owned by: (a) one or more individuals who are residents in Ontario; (b) a registered charity with its head office Ontario; (c) a not-for-profit organization with its head office in Ontario; (d) a co-operative corporation all of whose members are resident in Ontario; (e) a partnership or limited partnership whose partners fall into categories (a) – (d) above, and for whom commercial electricity generation is not their primary business or employment (Community Energy Partnerships Program, 2010). This definition is amended from that offered by the Community Energy Partnerships Program (an initiative established by the OPA to aid Ontario community power groups) and the Rules for the Ontario FIT program (Ontario Power Authority, 2010, p. 22). The definition is not tied to the type of technology utilized for any renewable power installation, but rather is linked to the ownership structure of the installation. The European nations examined in the paper will have a slightly different definition of community power in their legislation, but the

above definition still functions as a reference point for the paper and is applicable to all discussion in the MRP of community power in Ontario.

The goal of the MRP is to explore what a legal framework for feed-in tariffs would look like if it was created with the express purpose of fostering community involvement and investment in renewable energy. What kind of safeguards and rules could be included in a feed-in tariff regime to encourage investment by community groups? What kind of trade-off between rapid deployment of renewable and less corporate investment would a privileging of community investment entail? Does community power offer substantial benefits over private, for-profit investment in renewable energy? Would privileging community investment in renewables through the FIT slow the deployment of renewables throughout the province?

There are various benefits created by community/municipal sustainable energy that may outweigh the possible shortcomings. Research has shown that community investment in renewable energy installations (specifically wind) has reduced opposition to renewable developments within communities and may also help to create a political base for support of renewable energy (Dent, P. & Sims, S., 2007)(Toke, D., 2005). Community/municipal power has also been shown to give more of an economic benefit to the local economy than investments from private, outside actors (Welsh, T., 2005). There is also evidence that co-operative community investment may be a useful tool for building "social capital" and local democracy by and involving citizens more heavily in their communities (Commission of the European Communities, 2001).

One potential problem created by a focus on investment by community/municipal actors instead of investment by the private, for-profit sector is the possibility that the deployment of renewable resources in the province will be sluggish in comparison to a regime with no barriers to

corporate investment. However, community and municipal initiatives have been a key part of sustainable energy development in Germany and Denmark, and while cultural differences do exist between Europe and Canada, it is not yet determined whether a focus on community/municipal investment would have any ill effect on the pace of renewable deployment in Ontario (Gipe, P., 2007).

e) Why Ontario is an Ideal Jurisdiction to Examine

Ontario's energy system is at a crossroads. The province's aging power infrastructure is in need of extensive refurbishment, and will need to be almost completely reconstructed and/or replaced over the next 20 years (Winfield, Gibson, Markvart, et al., 2010, p. 4116) . The governing Liberal party, as well as the opposition parties, have committed to phasing out the province's coal-fired power plants, responsible for 18 per cent of the province's power, by 2014 (Winfield, Gibson, Markvart, et al., 2010, pp. 4115-4116). Both opposition parties have also committed to phasing out coal power, with different dates for its termination (Winfield, Gibson, Markvart, et al., 2010, p. 4115). This initiative, alongside the need to replace aging infrastructure has left open the opportunity for installing new energy sources. In May of 2009 Ontario enacted the *Green Energy Act* with the stated aim of making Ontario a center of renewable energy production and manufacturing and creating tens of thousands of jobs in the industry ("Ontario's Long-Term Energy Plan," 2010). As part of this initiative the province has provided substantial subsidies to Samsung Corporation to begin manufacturing wind turbine components (Hamilton, T., 2010). The province has also implemented an FIT, based on European models that have been implemented in countries such as Denmark, Spain and Germany and the first comprehensive one of its kind in North America ("Ontario's Long-Term Energy Plan," 2010, p. 29).

Due to the aforementioned factors there are debates taking place in the province that could be informed by the investigations carried out in this paper about community power and FITs in general. While the current Liberal government has consistently affirmed its commitment to nuclear power, the exorbitant cost of nuclear (with estimates ranging from between $23 billion and $26 billion for two new reactors with generating capacities of 1600MW and 1200 MW, respectively) has resulted in a cessation of the province's nuclear procurement plans (Winfield, Gibson, Markvart, et al., 2010, pp. 4123-4124). The debate over Ontario's energy future is ongoing and may yet be influenced by the recent disaster in Japan and the continued high costs of nuclear power. The opportunity now exists for Ontario's energy system to go in a number of different directions, one of those directions being a rejuvenated system based on a greater percentage of renewable energy and more aggressive energy efficiency measures (Winfield, Gibson, Markvart, et al., 2010, p. 4125). The government could elect to invest heavily in nuclear power after all, and exclude energy efficiency and sustainable energy options, but it could also choose a "greener" route. If the latter is pursued, the creation of a legal framework for the FIT that would encourage citizen investment could be a catalyst that spurs the founding of new energy cooperatives and citizens groups that are directly involved in the creation and maintenance of a sustainable energy grid, possibly leading to the aforementioned benefits.

2. Methodology

a) Comparative Public Policy and Public Law

Research will be conducted through an analysis of how different European countries (Germany, Spain and Denmark) structure their FIT regimes. This analysis will require obtaining the legislative framework for the regimes in each of the countries and then carrying out a comparative law and public policy analysis between the frameworks used by the three countries and the extant

one in Ontario. In carrying out the exploration it will be remembered that there are certain inherent limitations in any analysis utilizing comparative public policy, or law. The difficulties of being familiar enough with a country to analyze it on a policy-relevant level are great, precisely because the analysis does not take place using solely empirical data "but also precisely because policy analysis *is* part art and craft as well (italics in original)" (Doern, G. B., 1996, p. 21). Any comparative analysis of policy and law should deal with "difficult and often impossible to quantify variables such as the influence of ideas and structural/institutional entities, policy communities, and political cultures" (Doern, G. B., 1996, p. 22). Care will be taken throughout the research to examine not only how policies have been crafted, but also how each country's culture has influenced the development of their FITs, and how these differences may affect the FIT regime in Ontario as opposed to Northern Europe.

Doern also posits that the more countries being examined, the more challenges the researcher faces in delivering a comprehensive comparative analysis, this research addresses that problem somewhat by focusing on only three countries, as previously stated, due to their leadership in the field of FITs and Ontario as possibly the first North American jurisdiction to adopt a European-like FIT regime. The MRP will attempt to determine how feed-in tariff regimes are structured in the aforementioned European countries, and how different societal actors are encouraged, or discouraged, from taking advantage of the opportunities offered by the FITs. A careful analysis of the evidence will be conducted to determine to what degree the FITs actually promoted the growth of sustainable energy in each country. It should also be determined if these regimes have actively involved community groups and co-operatives in the production of renewable energy, and if so, what types of regulations were used to spur their involvement. Do the tariff laws contain safeguards that ward off greater investment by larger private, for-profit actors? Were the

creators of the tariff legislation in other countries preoccupied with fostering deeper community involvement or did they see all investment as beneficial if it aided in the development of sustainable energy?

The research methodology will help to answer the research questions by supplying an understanding of the workings of feed-in tariffs and how they have been structured, and to what purpose, in other countries.

(ii) Conception/Theory of Law

The debate over different conceptions or theories of law will not be a focus of this paper, but a brief discussion of the legal theory subscribed to by the author will be undertaken. Positive legal theory endeavours to predict and explain the content of legal rules (Solum, L.B., 2007). A functional explanation for the content of those legal rules, otherwise known as legal functionalism, is one stream of legal positivism. The author does not necessarily subscribe to any one legal theory, but legal functionalism is the concept that most closely resembles the author's way of conceptualizing law. Legal functionalism explores why legal rules have the content and form that they do and since the MRP is focused on crafting a new legal framework with a particular goal in mind (the creation of more community power) functionalism appears to be an appropriate theory to incorporate into the paper. Functionalism posits that the content of a given rule is causally explained by the function of the rule (Solum, L.B., 2007). A rule whose function is to facilitate the growth of community power groups and enabling those groups to easily construct renewable energy installations would necessarily contain specific content to aid community power groups and renewable energy. A set of rules established to aid community power groups focused on renewable

energy generation may contain provisions slighting corporate energy production or carbon-based energy generation as a function of the rules' goal.

b) Role of Primary and Secondary Materials

Sifting through the related literature has allowed the MRP to state with some authority whether FITs are a good tool to fuel investment in renewable energy. This understanding, combined with the input of useful interview subjects, has ensured that the tools used to craft the MRP and the legal framework contained within it; the framework ensuring that community groups are presented with sufficient opportunities to take advantage any proposed feed-in tariff regime in Ontario, are sufficient to answer the research question.

The sources and literature used to examine the European systems consist of primary sources and secondary analyses, whereas the research on Ontario was completed using mostly primary sources. Primary resources for the German and Danish FIT policies exist in English, and have already been obtained. The Spanish royal decrees that implemented the FITs in Spain may only exist in Spanish, but that does not pose a problem as the researcher can read Castilian.

Internet research is a key component of the data collection because much of the literature on the subject exists in the cyber sphere. The primary sources, such as the European legislation overseeing FITs, are available on the internet, as are many of the secondary sources analyzing the success of FITs. Hard copies of the literature were obtained where possible.

c) Constraints, Limitations, Challenges

There are a few important knowledge gaps and concerns specific to Ontario that inform this topic. As discussed in the preceding scoping section (2 (c)), the way forward for the Ontario electricity system is unclear and the possibility does exist that the government will choose to focus

its resources on nuclear power at the expense of advancing renewables. While this is a concern, the uncertainty in the electricity system does allow for the possibility of great development of renewables and an aggressive adoption of developments under the FIT and it is hoped that research such as this may help to sway development towards sustainable energy sources.

Another challenge is the possibility that the conditions, both socio-cultural and economic, do not exist for extensive investment in the renewable sector in Ontario by community/municipal groups. The chance exists that a legal framework for FITs conducive to community investment could be created, but that there would not be enough interest from community groups and municipalities to take advantage of the regime.

3. Theoretical Frameworks for Determining Policy Goals and Instrument Choice

a) Defining Sustainable Energy

Underpinning the theoretical framework of the paper is the notion of sustainable energy, an idea that encompasses not only renewable energy, but holds positive social implications as well. The essence of sustainable development, as explained by Gibson - one of the foremost theorists in the field, is an understanding that long-term gains are dependent upon complex links between economic, social and ecological factors that are entwined in distinct ways depending on local conditions (Gibson, Hassan, Holtz, et al., 2005, p. ix).

Gibson's analysis of the sustainability requirements that make up decision-making criteria can be utilized to aid in determining both policy goals and policy instruments and will be adopted for the research. The policy goals that are to be addressed in this paper are: 1. mitigation of GHGs; 2. implementing greater renewable power generation in Ontario; 3. achieving these two goals while nurturing political support for renewables, and; 4. generating as many benefits for local communities

as possible while pursuing the preceding goals. It should be remembered that there will inevitably be trade-offs in any project or endeavour, and almost every undertaking will carry sustainability gains and losses (Gibson, Hassan, Holtz, et al., 2005, p. xii). Because of this reality it is essential to determine which sustainability objectives have priority and what compromises and sacrifices are tolerable, while attempting to determine how overall sustainability can be improved (Gibson, Hassan, Holtz, et al., 2005, p. xii).

The priority of sustainability objectives requires cognizance of the true hierarchy of issues. The economy is a construct of, and dependent upon, human society and that same society is dependent upon the ecology and the earth. Therefore if one of the 'lesser' categories is causing harm to one of the 'greater' ones then the course of action will have to be revised (Gibson, Hassan, Holtz, et al., 2005, pp. 56-57). Gibson posits that any initiatives whose aim is improved sustainability should be based on criteria whose goal is to create various, enduring, mutually reinforcing gains instead of simply mitigating environmental damage (Gibson, Hassan, Holtz, et al., 2005, p. 165). To this end, Gibson's criteria for sustainable development include: socio-ecological system integrity, livelihood sufficiency and opportunity, intragenerational equity, intergenerational equity, resource maintenance and efficiency and socio-ecological civility and democratic governance, precaution and adaptation, and immediate and long-term integration (Gibson, Hassan, Holtz, et al., 2005, pp. 116-118). These criteria will be applied now, while evaluating policy goals, and later, when exploring policy instrument choice.

Socio-ecological system integrity requires maintaining "the long-term integrity of socio-biophysical systems and protect[ing] the irreplaceable support functions upon which humans as well as ecological well-being depends" (Gibson, Hassan, Holtz, et al., 2005, p. 116). This need is addressed in policy goals 1 and 2.

Livelihood sufficiency and opportunity refers to the need to ensure that every community, and everyone in that community, is provided with enough resources so that they are living above subsistence levels and have access to opportunities to improve their situation without imperilling the chances of future generation's opportunity and sufficiency requirements (Gibson, Hassan, Holtz, et al., 2005, p. 116). Policy goal four touches on these issues and they will be further developed in the following section discussing policy instruments.

Intragenerational equity requires that decisions are executed in a manner that also acts to lessen the disparity between the wealthy and impoverished in terms of sufficiency and opportunity (among other factors) (Gibson, Hassan, Holtz, et al., 2005, p. 116).

Intergenerational equity involves selecting options that have the most chance of preserving the potential for future generations to live sustainably (Gibson, Hassan, Holtz, et al., 2005, p. 117). Again, policy goals 1 and 2 are applicable here.

Resource maintenance and efficiency aims to provide sustainable livelihoods to all people and at the same time diminish threats to enduring socio-ecological system integrity through a reduction in waste generation, extractive damage and a decrease in total energy and material use per unit of benefit (Gibson, Hassan, Holtz, et al., 2005, p. 117). Policy goals 2 and 4 could both be seen to aid with the creation of sustainable livelihoods and goal 2 is specifically targeted and reducing waste generation, extractive damage and lessening threats to socio-ecological system integrity.

Socio-ecological civility and democratic governance involves improving the capacity and habitual inclination of society (encompassing individual citizens, communities and collective decision making bodies) to adhere to sustainability principles through greater transparency and dispersal of information when considering a course of action and making greater attempts to foster a sense of

collective responsibility and awareness, along with integrating a mix of customary, administrative, market and personal in the decision making process (Gibson, Hassan, Holtz, et al., 2005, p. 117). It is possible that policy goal 3 addresses this principle by attempting to involve more people in the political discourse, even if it is with the particular aim of generating more support for renewables.

Precaution and adaptation aims to evade risks, even ones that are not yet fully comprehended, that could cause grave or irreversible damage to the groundwork for sustainability and accepts that plans will have to evolve and leave room for surprises and the need to adapt to changing circumstances (Gibson, Hassan, Holtz, et al., 2005, p. 118).

Immediate and long-term integration refers to applying all the principles of sustainability with the aim of creating and reinforcing multiple gains and mutually supportive benefits (Gibson, Hassan, Holtz, et al., 2005, p. 118). Policy goals 3 and 4 adhere to this principle as the instrument chosen to achieve will attest to.

The essence of Gibson's list of criteria is the notion that the separation of social, economic and biophysical criteria must be abandoned when a new policy instrument is being implemented (Gibson, Hassan, Holtz, et al., 2005, p. xi). To determine whether a new measure will contribute to sustainability all of the preceding factors and their interconnections must be considered as a whole (Gibson, Hassan, Holtz, et al., 2005, p. xi).

i) Advantages and Disadvantages to Privileging Community/Municipal Investment over Corporate Investment in Renewable Energy Through FITs in a Sustainability Framework

There are both pros and cons to giving community investments privileged access to the FIT at the expense of private, for-profit investment, but the benefits may outweigh the disadvantages

Research has shown that community investment in renewable energy installations (specifically wind) has reduced opposition to renewable developments, especially in the planning and permitting stages, and may also help to create a political base for support of renewable energy (Dent, P. & Sims, S., 2007)(Toke, D., 2005)(Bolinger, M., 2001). This advantage addresses Gibson's criteria of *Socio-ecological civility and democratic governance* by, hopefully, involving more citizens in the political process and providing them with a stake in an evolving process in their community where the merits and drawbacks of renewable energy are discussed and debated. *Precaution and adaptation* may also be aided as private actors who are seen to be "forcing" renewable energy on any given community could risk poisoning those communities against renewables. In this light community power could be seen as a measure to reduce resistance to renewables before it gains more strength and begins to further interfere with the prospects for renewable generation in the province.

With community power a greater potential exists for distributed generation benefits and siting renewables, especially wind, close to load which would decrease transmission costs as well as reduce the need for new transmission lines or upgrades (Bolinger, M., 2001). Due to higher levels of community acceptance and participation, mid-sized community power projects can also be located in urban centers (as per the examples of Copenhagen and Toronto), whereas large commercial projects often have to placed long distances from loads, thereby making distributed generation an impossibility and creating the need for new transmission lines (Bolinger, M., 2001). These advantages fit under *resource maintenance and efficiency* as fewer transmission lines and less energy lost through transmission act as reductions in waste of energy and resources and a decrease in the total energy and material use per unit of benefit (Gibson, Hassan, Holtz, et al., 2005, p. 117).

Community/municipal power has also been shown to give more of an economic benefit to the local economy than investments from private, outside actors (Welsh, T., 2005). There is also

evidence that co-operative community investment may be a useful tool for building 'social capital' and local democracy by involving citizens more heavily in their communities (Commission of the European Communities, 2001). *Democratic governance* is aided here by involving citizens in their local community, *livelihood sufficiency and opportunity* is served through the betterment of the local economy and the provision of jobs that cannot be outsourced and that do not impair the sufficiency requirements of future generations. *Intragenerational equity* is addressed because instead of money flowing to bastions of wealth such as large, private corporations, money is distributed throughout the community, hopefully lessening the disparity between the 'haves' and the 'have-nots'. Finally, community power aids *immediate and long-term integration* because of the multiple and interconnected benefits, just described, that it bestows on communities.

This is not to say that community power is without its difficulties. One potential problem created by a focus on investment by community/municipal actors instead of investment by the private, for-profit sector is the possibility that the deployment of renewable resources in the province will be sluggish in comparison to a regime with no barriers to corporate investment. Larger developers usually have quicker access to larger amounts of capital than community groups would. However, community and municipal initiatives have been a key part of sustainable energy development in Germany and Denmark, and while cultural differences do exist between Europe and Canada, it is not yet determined whether a focus on community/municipal investment would have any ill effect on the pace of renewable deployment in Ontario (Gipe, P., 2007).

Another potential drawback to community power projects is a lack of economies of scale when compared with larger, private projects (Bolinger, M., 2001). It should be noted that community projects are not always smaller in size than commercial ones, but it is generally the case. Renewable development, especially with wind power, comes with myriad fixed costs, such as: legal

fees, steering through the permitting process, hiring crews and machinery to construct/erect the installation, the construction of access roads to the site, the construction of transmission lines to deliver power and the creation of a substation to connect to the grid (Bolinger, M., 2001). Large installations can distribute these fixed costs over many wind turbines (or solar panels, as the case may be) and may receive volume discounts from the manufacturers of the particular renewable technology, thus realizing economies of scale not available to smaller, community run, projects (Bolinger, M., 2001).

Private projects may also benefit from a streamlined corporate structure as opposed to community projects where the ownership structure may be fragmented and force developers to deal with too many stakeholders when undertaking a project.

b) Policy Instruments for the Promotion of Renewable Energy

Since so much of what society now does and proposes lacks any effort at sustainability, it would be unrealistic and overly ambitious to think that new measures that take sustainability into account (or aim for sustainability) will meet every sustainability criteria (Gibson, Hassan, Holtz, et al., 2005, p. 119). This should be remembered when it is stated that true sustainability will require success on all fronts (Gibson, Hassan, Holtz, et al., 2005, p. 91). Success may be essential in the long-term but in the "now" the pursuit of one valuable priority will regularly conflict with other worthy goals (Gibson, Hassan, Holtz, et al., 2005, p. 91). In comparative evaluations between various options, trade-offs are inevitable (Gibson, Hassan, Holtz, et al., 2005, p. 126). There are choices to be made at each stage, with each choice eliminating several possibilities each with its own advantages and disadvantages (Gibson, Hassan, Holtz, et al., 2005, p. 126). When analysing various options the focus should not be whether an option is acceptable, but rather whether it is the best choice for achieving the sustainability criteria, serves the overall purpose of the initiative, involves

the most "acceptable" trade-offs and optimizes the chances for mutually reinforcing sustainability gains (Gibson, Hassan, Holtz, et al., 2005, p. 175). It will be demonstrated that when this analysis is undertaken an FIT scheme that places additional value on encouraging community power and investment will be the optimal selection.

As previously discussed, two main strategies have emerged for promoting the growth of renewables: feed-in tariffs (FITs) and the "quota system". A quota system is used in the UK where it is known as the 'renewables obligation' (RO), whereas FITs have been popularized in Germany, Spain and Denmark. An FIT is a pricing law under which renewable energy producers are paid a specified rate for the electricity they produce, this rate is usually differentiated according to the manner of energy production and the size of the energy installation (Mendonca, M., 2007, p. 8). There are various permutations of FITs and some of the key components of the most successful ones are: (i) a rate that ensures profits for the energy producer without creating a "windfall"; (ii) the period for which the specified rates are set is legally guaranteed and lasts for most of the lifespan of the installation, thus providing certainty for investors; (iii) operators of the electricity grid are obligated to provide priority access to the grid for renewable energy projects (Mendonca, M., 2007, p. 8). The additional energy costs are paid by suppliers in proportion to their volume of sales and are then passed on to electricity consumers through a premium on the end-user price (Mendonca, M., 2007, p. 8).

In contrast to the FIT, which uses state intervention to set prices for different types of renewable energy, a quota system such as the RO is dependent on market-based procurement mechanisms. Generally, the government will set a minimum share of energy generation or capacity that must come from renewable sources (Mendonca, M., 2007, p. 10). The allotted portion of renewable energy increases over time and usually there are specific targets and a set end-date

(Mendonca, M., 2007, p. 10). The obligation/certificate and the tendering system are the two main types of 'quota' systems.

An obligation/certificate scheme works similarly to the brief description of quota systems outlined above. A target, which is supposed to increase with time, is set out for the minimum amount of generation or capacity that must come from renewable energy (Mendonca, M., 2007, p. 10). It is left to the investors and generators to decide how they will reach the targets and what type of technology they will use, what developers they will work with and the contract and price details (Mendonca, M., 2007, p. 10). When the target period ends, electricity suppliers or generators, depending on the policy, will have to provide proof that they have complied with the target or face paying a penalty (Mendonca, M., 2007, pp. 10-11). The proof consists of "green certificates" that producers receive for the electricity they generate from renewable sources (Mendonca, M., 2007, p. 11). Actors with a surfeit of certificates can then trade or sell them to those who have not met the target. Alongside setting the targets, government also certifies the credits and monitors compliance and enforces the set penalties (Mendonca, M., 2007, p. 11).

In a tendering system the amount of generating capacity or the share of total electricity to be generated by renewable is set by the regulator and a maximum price per kWh is established (Mendonca, M., 2007, p. 14). Renewable energy developers then submit bids for specific contracts (Mendonca, M., 2007, p. 14). The government sets the levels of generation desired from each renewable source as well as the rate of growth it requires over time (Mendonca, M., 2007, p. 14). Bids are usually accepted starting with the most cost-effective entry and working towards the more expensive proposals until the desired targets are achieved (Mendonca, M., 2007, pp. 14-15). Power utilities, occasionally with the aid of a government fund, are then obligated to buy electricity at the price listed in the successful bids (Mendonca, M., 2007, p. 15). The winning bidders have their

prices guaranteed for a set time period and energy providers must pay a premium price for a certain amount of that renewable energy (Mendonca, M., 2007, p. 15).

A tendering system is run by a government and requires that developers of renewable energy bid for the chance to win power purchase agreements and/or access to a fund administered by that government through competitive bidding (Mendonca, M., 2007, p. 14). A specific amount of capacity or share of total electricity to be generated by renewable means and the maximum price per kilowatt hour (kWh) is stipulated by the regulator and developers then submit offers for contracts (Mendonca, M., 2007, p. 14). Desired levels of generation from each renewable technology as well as the growth rates required over time are set by the government as is the criteria for evaluation that are set before each round of bidding (Mendonca, M., 2007, p. 14). Proposals from developers are usually accepted beginning with the lowest bid and working upwards until the desired amount of generation or capacity is reached (Mendonca, M., 2007, pp. 14-15). Governments will sometimes stipulate that there must be different bids for different renewable technologies so that there is no direct competition between, for example, solar and wind installations (Mendonca, M., 2007, p. 14). Utilities are typically required to buy the electricity at the price offered by the successful bids and the winning bidders are guaranteed the price for a certain period of time (Mendonca, M., 2007, pp. 14-15).

The U.S., China, France, the UK and Canada (Ontario) have all utilized tendering systems. When compared to FITs, tendering systems have been less successful in spurring the deployment of renewable energy installations (Mendonca, M., 2007, p. 15). Tendering systems have encountered problems due to producers being scared away by overly complex procedures; uncertainty in the market created by intermittent tenders, and; low bids due to the structure of government tendering

processes, thus leading funds to be allocated to projects that were not, and could not be, completed (Mendonca, M., 2007, p. 15).

In comparing the two approaches outlined above, recent literature on instrument choice in public policy should be consulted. The literature has stressed evaluating different options based on effectiveness, efficiency and fairness (Winfield, M., 2009). When FITs and quota systems are compared using the three criteria laid out in the in the literature FITs appear to be the preferable option.

Efficiency is defined in the literature as a government's attempt to reach their policy goals by expending the lowest possible amount of capital so that the limited resources available can be utilized on other issues (Winfield, M., 2009). Numerous aspects of the concept of efficiency exist alongside the general definition given in the preceding sentence including: "the achievement of the desired result at minimum cost to society as a whole, to the government agencies that will have to implement and administer the chosen instruments, and to the individuals and organizations whose behaviour will be affected" (Winfield, M., 2009).

The argument has been made that FITs are not the most cost effective instrument for spurring growth in renewable (Mendonca, M., 2007, p. 34). However, FITs would seem to constitute an efficiency enhancing policy instrument as the investing spurred by FIT regimes is generally not made by the government sector and debt is not incurred by society as a whole, but by separate actors willing to invest in renewable energy. The argument is made that the higher costs of renewable energy are eventually passed on to ratepayers through their power bills and that these costs are higher than they might otherwise be if another policy instrument, such as a tendering system, was utilized. However, many experts have asserted that the production of renewables

develops more rapidly under FIT's than any other policy (Scheer, 2007)(Bolinger, M., 2001). Although costs are an important consideration, they are but one of many factors to assess when deciding upon a policy instrument to adopt. As Gibson stresses, the essence of any sustainable initiative is an acceptance of the complexity and interconnectivity inherent in all policies. Since the policy goal is to explicitly create more renewable energy, would it be wise to enact a policy that was, perhaps, less expensive but also resulted in fewer renewable installations being built? Also, since the economy is dependent upon humanity, and humanity is dependent on the ecosystem, should a relatively small difference in cost be enough to tip the scales in favour of an instrument when there are numerous other factors mitigating in favour of another instrument? Gibson's discussion of the true hierarchy of issues and his sustainability criteria would indicate to the contrary (Gibson, Hassan, Holtz, et al., 2005, pp. 56-57). Finally, while FIT's may cost slightly more than other instruments, economic instruments as a whole, including FITs, have been lauded as a means of reaching policy goals at comparatively lower costs (when contrasted with regulatory measures) as actors affected by the instruments can decide individually how the react to the price signals given by the policies (Winfield, M., 2009).

FIT's also excel when measured by the third factor, the fairness criteria of distributional benefits. FIT's can distribute economic benefits throughout the province through job creation and they may also be able to overcome one of the major challenges of more "coercive" economic instruments, the lack of a specific constituency (Winfield, M., 2009). Not only could a wide sector of society benefit from FIT's through the aforementioned job creation and environmental gains, if community investment is encouraged it could create a significant constituency with interest in encouraging renewable energy and protecting FIT's and possibly enhancing socio-ecological civility and democratic governance as discussed by Gibson. The constituency would be made up of all

those involved in the creation of renewables through FIT-related projects. Since the participants in the projects, be they investors, construction or maintenance workers, or landowners would all have a financial stake in the FIT and its continued success they would, presumably, form a strong local constituency in favour of the policy and in favour of renewables in general.

The public acceptability of any potential instrument should also be taken into consideration (Winfield, M., 2009). A carbon tax and the higher energy prices that would accompany it still lacks popularity among Canadians, as the failure of former Liberal leader Stephan Dion's 'Green Shift' plan, and the avoidance of proposing a carbon tax by the three main parties, demonstrates. Governments have come across less resistance when they institute subsidies for activities and technologies to reduce GHGs, a category the FIT would fall under. While there has been resistance to wind energy throughout Ontario, there seems to have been little outcry over the implementation of FITs indicating, if not public support for the initiative, at least public acceptance of it.

The introduction of greater renewables could also be used to further the 'livelihood sufficiency and opportunity' and 'socio-ecological civility and democratic governance' goals of truly sustainable development. FITs in particular have the capacity to aid with the above criteria, especially if the renewable projects brought about under the tariffs are constructed through a community power regime.

4. Ontario Context, Situation

a) Ontario Electricity Policy

The future of electricity generation in Ontario contains an inherent amount of uncertainty. As one energy expert has noted, the province is "flying blind" and does not have a clear direction with regards to its energy policy (Hamilton, T., 2009). However, recent events have worked to

clarify the direction the provincial government wishes to proceed in, although there are various hurdles the government will have to clear if it hopes to implement its chosen course of action.

As the province's new long-term energy plan confirms, Ontario's Liberal government, despite the obstacles facing it, remains committed to nuclear power. Although the GEA has tapped into a great enthusiasm for renewable energy development in the province, the government appears to be taking a step back from renewables and continues to prefer nuclear power over other generation methods. Despite the Liberal's claims that they wish to be at the forefront of renewable energy in North America, the long-term energy plan intimates that renewable generation will be "capped" after 2018. The plan projects that 10,700MW of renewable capacity from wind, solar and bioenergy will be online by 2018 ("Ontario's Long-Term Energy Plan," 2010, p. 18). By 2030 the plan forecasts exactly the same amount of renewable energy for the province, 10,700MW ("Ontario's Long-Term Energy Plan," 2010, p. 64). Effectively, this would mean no construction of new renewable capacity for the twelve years succeeding 2018. The same thing is forecast for renewable hydroelectric power in the province. The plan calls for 9,000MW to be online by 2018, and for 9,000MW to be online in 2030 ("Ontario's Long-Term Energy Plan," 2010, pp. 27, 65). Again, this indicates no growth in hydroelectric capacity in the province for more than a decade following 2018. It seems unlikely that all opportunities for constructing all types of renewable energy in the province will have been exhausted by 2018, so the lack of growth in renewables appears to be a cap on renewable energy by the province. This cap is another indication of institutional reluctance, if not outright hostility, shown to renewable technologies by the Ontario Power Authority (OPA). The OPA is the body responsible for "ensuring a reliable and sustainable supply of electricity for Ontario" ("Ontario's Energy Landscape," 2010) and, as indicated by

previous iterations of the Integrated Power System Plan (IPSP) and the new long-term energy plan, harbours a preference for nuclear power.

Although the GEA has established a microFIT program for installations of 10 kilowatts or less which is supposed to spur involvement in the energy sector by individuals and smaller groups the government lacks a clear strategy for fostering community based power development. The lack of a community development program may have contributed to the vocal opposition to wind power in the province, highlighted by a recent court case seeking a moratorium on the building of further windmills in the province (Blackwell, R., 2011). Despite claims to the contrary, rural opposition to wind power may have caused the government to suspend construction of all proposed offshore wind energy projects. It is an election year in the province and the Liberals appear to be distancing themselves from renewable energy, specifically wind power, in the hopes of retaining rural ridings. This opposition and concern over the costs and local impacts of renewable energy in the province may not have the support of science or fact, but they are still important issues in the development of renewables in Ontario and seem to precipitate a slight pullback from the GEA on the part of the government.

Alongside the problems faced by renewable power in the province, nuclear energy, also faces a number of hurdles, including decreased energy demand, overwhelming cost, and an uncertain future for the company most likely to construct any reactors in the province.

Demand for power in the province has diminished considerably in the past few years. From a high of 151 Terawatt hours of electricity being used in Ontario in 2006, consumption had fallen to 139 terawatt hours by 2009 (*The Ontario Reliability Outlook*, 2009)(Spears, J., 2010). Debate continues as to whether the province's energy use will continue to decrease or whether there will be a slight

upswing in consumption in the near future. Conflicting projections point to either a very gradual increase in consumption, up to 142 terawatt hours by 2011(Spears, J., 2010), or a further decrease in demand of .7 per cent per year from 2009 to 2018 (Hamilton, T., 2009). Due to the downward drift in energy consumption in Ontario as well as various sources of new generation coming online the Independent Electricity System Operator (IESO) estimates that there will be an energy surplus roughly 14.5% of the time by 2013 (Spears, J., 2011). The 14.5% surplus projected by the IESO challenges the projections of the province's long-term energy plan. This contrasts with the long-term energy plan's projection of large power deficits appearing in the province. Less demand for power reduces the need to construct large, constant generators like nuclear installations whose power generation cannot be quickly ramped up or lowered to meet demand.

The IESO's projections are disregarded by provincial government's long-term energy plan which is meant to map out the province's energy strategy until 2030. The plan cites a surge in Ontario's population in the next two decades, a growing demand for electricity from a surging "high-tech" industrial sector, and an increase in the amount of electric vehicles in the province as evidence that Ontario will consume moderately more amounts of power (15% more) and will need new generation facilities in the next 20 years to meet this demand ("Ontario's Long-Term Energy Plan," 2010, pp. 8, 10). These projections are the "medium" projection of the plan and call for an increase in demand starting in 2018, although it is unclear from the report why this is the year when demand will truly start to increase ("Ontario's Long-Term Energy Plan," 2010, p. 14).

Despite future predictions of energy surpluses in the province Ontario's nuclear fleet is aging and something will have to be implemented to take its place (Spears, J., 2010). The issue of whether to replace the outgoing nuclear facilities with more reactors or with other energy sources "remains a huge, unanswered question"(Spears, J., 2010). Renewable energy proponents have attempted to

frame the issue as a choice between a greater reliance on renewable power and electricity efficiency or continued dependence on nuclear power, but they do not appear to have the government's ear (Weis, T., Shawn-Patrick, S. & Stewart, K., 2010, p. 9).

Even with the Liberal's strong desire to build more reactors, it may not be feasible because of the uncertain future of the atomic energy industry in Canada. Atomic Energy of Canada Ltd. was the only "compliant" bidder for the job of building Ontario's new reactors, but its bid was rejected for being "'billions' too expensive"(Weis, T., Shawn-Patrick, S. & Stewart, K., 2010, p. 7), and was up for sale, but its potential buyers have backed out, leaving the future of the company "cloudy" (Spears, J., & Benzie, R., 2011)("Ontario's Long-Term Energy Plan," 2010, p. 24). The provincial government appears to be lobbying the federal government to take an interest in AECL and ensure its survival, but Ottawa has not seemed receptive to this plan (Spears, J., & Benzie, R., 2011)("Ontario's Long-Term Energy Plan," 2010, p. 24). Energy minister Brad Duguid stated that the province "will be moving forward with the purchase of these two new units, and the refurbishment of our (existing) units. That's not in question"(Spears, J., & Benzie, R., 2011). However, as NDP energy critic Peter Tabuns noted, the uncertain future of AECL undermines the long term energy plan released by the provincial government (Spears, J., & Benzie, R., 2011). Tabuns stated that "[The provincial government is] basing almost half their investment, or more, on a company that may not exist in the next year or so. That's an awful lot of risk...to be taking with its energy system"(Spears, J., & Benzie, R., 2011).

Due to AECL's tenuous situation and the possible energy surplus that the province may be running (which would help to preclude further investments in nuclear energy), the door may still remain open for the implementation of renewable energy above and beyond the levels called for in the long-term energy plan. The government's position is full of contradictions and it is difficult to

determine what the final outcome will be, but the Liberal's apparent diminishing enthusiasm for the GEA is not a positive sign. Some of this uncertainty may be resolved with the release of the next IPSP. The new IPSP is due in mid-2011with the Ontario Energy Board (OEB) conducting a review of the plan through 2011-2012 ("Ontario's Long-Term Energy Plan," 2010, p. 64).

b) Green Energy Act and its consequences/possibilities

The provincial government claims that the GEA will help Ontario become "North America's leader in renewable energy" ("Ontario's Green Energy Act," 2010). The provincial government has also claimed that the GEA will create 50,000 jobs in the province within the *Act's* first three years (The Canadian Press, 2009). The claims of 50,000 jobs created have not yet been fulfilled, although it is clear that the Act is creating jobs and fostering change in Ontario's energy industry. As of the third quarter of 2010 the province had 1,289MW of wind power in operation with 2,103 more in development; 1,637MW of water power with 691MW in development; 55MW of bionergy in operation with 80MW more in development; and, 118MW of solar power in use with 1,144 in development (*A Progress Report on Electricity Supply: Third Quarter 2010*, 2010, p. 8). This rapid growth in the province's renewable energy installations is due, at least in part, to the *Act* and its Feed-in Tariff program. An amendment to section 25.35 of the *Electricity Act, 1998* brought about by the GEA allowed the Minister to order the OPA develop the FIT program ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 3).

As of the end of the third quarter 2010, the OPA had executed 1,073 FIT contracts with a combined generating capacity of 2,501 MW (*A Progress Report on Electricity Supply: Third Quarter 2010*, 2010, p. 9). In addition the OPA had received close to 3,400 FIT applications with a combined capacity of nearly 15,500 MW as of the end of the third quarter 2010 and applications continue to be accepted and processed (*A Progress Report on Electricity Supply: Third Quarter 2010*, 2010, p. 9). The

OPA has since received applications for a further 8,000 MW of renewables (Weis, T., Shawn-Patrick, S. & Stewart, K., 2010, p. 6). More than 500 renewable projects were approved in Ontario in early 2010 (Weis, T., Shawn-Patrick, S. & Stewart, K., 2010, p. 6) and in the 6 months leading up to august 2010 the provincial government contracted for the building of 4,800 MW of new renewable energy before 2015 (Weis, T., Shawn-Patrick, S. & Stewart, K., 2010, p. 3). Two of Ontario Power Generation's (OPG) coal generating facilities are being converted to biomass facilities (Weis, T., Shawn-Patrick, S. & Stewart, K., 2010, p. 3).

The regulatory changes contained in the Act should be given credit for spurring the recent growth of renewable in the province and one of the more important pieces in the Act is the streamlining of the approval process under the Environmental Protection Act (EPA). Under section 47.3 of the EPA this streamlining consists of combining the approval requirements of the EPA, the *Ontario Water Resources Act* (OWRA), the *Planning Act* and the *Municipality Act* into a single renewable energy approval granted with the approval of the Ministry of the Environment ("Green Energy and Green Economy Act, 2009: Compendium," 2009, pp. 6-7)

The *Act* also brings about significant changes in a number of pieces of related legislation ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 1). Changes are made to the *Electricity Act, 1998*. These changes include amending section 1 of the Act to include definitions for "renewable energy generation facility" and "smart grid" and the Lieutenant Governor in Council is granted the power to create regulations governing and implementing the smart grid under section 53.0.1 of the Act ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 2). Section 25.32 of the Act allows the Minister to direct the OPA to commence to solicit for any type of initiative relating to the acquisition of electricity supply and capacity, thereby providing the Minister with the power to order the OPA to try and obtain renewable energy sources ("Green

Energy and Green Economy Act, 2009: Compendium," 2009, p. 3). The *Act*, under subsection 25.32, also allows the Minister to order the OPA to institute measures to enhance the involvement of aboriginal people in developing and implementing renewable throughout the province ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 3). Section 26 of the *Act* is amended so that transmitters and distributors are obligated to give priority access to their systems to renewable energy generation facilities which meet certain criteria ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 3). The *Act* will also revise the licenses of distributors and transmitters by adding these further licensing conditions: (1) "an obligation of the licensee to provide priority connection access to its transmission or distribution system for renewable energy generation facilities that meet prescribed requirements"; and (2) "an obligation of the licensee to expand or reinforce its transmission system or distribution system to accommodate the connection of renewable energy generation facilities" (Mamay, A., & Richmond, M., 2009, p. 3). Furthermore, both distributors and transmitters will be obligated to connect renewable generation facilities to their distribution and transmission systems in cases where the renewable facility has satisfied provincial requirements with respect to the connection (Mamay, A., & Richmond, M., 2009, p. 3). Also, the GEA will permit a municipality or a distributor to directly own and operate renewable energy generation projects of 10 MW or less without using an affiliated corporation (Mamay, A., & Richmond, M., 2009, p. 3).

The *Ontario Energy Board Act, 1998* is also affected. Section 28.5 allows the Minister, if the Lieutenant Governor in Council approves, to issues directives to the Ontario Energy Board concerning a smart grid for the province ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 4). Section 28.6 grants the Minister, again with the consent of the Lieutenant Governor in Council, the ability to issue directives to the Board requiring it to take steps

to connect renewable generation facilities to transmission and distribution systems in the province ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 4). The amendments to the Act also call on the Board to "consider the promotion of the use of renewable energy sources" when considering if the construction or expansion of a transmission or distribution line is in the public interest ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 5).

As discussed earlier, the GEA also amends the *Environmental Protection Act*. Under section 47.5 of the EPA the Director is given broad discretion and can grant or renew, or refuse to grant or renew, an approval for a renewable energy project if doing so would "be in the public interest." ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 7).

Amendments to the *Co-operative Corporations Act* allow for the incorporation of renewable energy co-operatives and allow them to develop renewable installations and market renewable energy to electricity customers ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 9). Under the *Act*, a renewable energy co-operative is defined as a co-operative that engages only in the generating and vending of electricity generated by renewable energy sources ("Green Energy and Green Economy Act, 2009: Compendium," 2009, p. 9).

Another change brought about by the GEA will be a reduction in the independence of the OPA as to how it procures energy (Mamay, A., & Richmond, M., 2009, p. 2). Under the GEA the OPA can only acquire power when it has received specific directions from the Minister (Mamay, A., & Richmond, M., 2009, p. 2). The Minister's directive may concern what is to be procured (be it conservation, demand management or supply), what procurement process shall be utilized, what is to be paid and what consultations should be conducted (Mamay, A., & Richmond, M., 2009, p. 2).

According to the provincial government, the $16 billion of private sector investment in renewables and conservation has already been attracted to Ontario because of the *Green Energy Act* and more than 20 companies have plans to establish or expand operations in the province ("Ontario's Long-Term Energy Plan," 2010, p. 52).

Besides stimulating the production of renewable energy in the province and modifying the regulatory framework of the province's energy system, the Act hopes to stimulate manufacturing in Ontario. To achieve this the legislation requires that over half the materials green energy producers use to build their facilities must be made in Ontario if the producers are going to qualify for FIT contracts, as per s.2.1(e) of the FIT rules (Ontario Power Authority, 2010, p. 3). The local content requirement seems to have spurred international manufacturers to establish themselves in the province to qualify for the benefits inherent in the FIT ("Ontario Solar News," 2010). Three international solar energy parts manufacturers will open plants in Ontario within the next two years which will account for 900 direct jobs in the province and there are various other international manufacturers, including Bosh and Celestica, who are planning to open plants in the near future ("Ontario Solar News," 2010).

In early November of 2010 the economic development agency in Windsor stated that one out of every ten new jobs being created in the city were renewable energy jobs, accounting for 600 jobs so far (Neumann, K., & Smith, R., 2010). In October 2010 a second solar manufacturing facility was announced for Guelph, creating almost 600 direct jobs (Neumann, K., & Smith, R., 2010). New solar manufacturing plants have also been announced in London, Toronto and Windsor (Neumann, K., & Smith, R., 2010). 10 times as many solar panels as existed in all of Canada in 2009 will be installed in Ontario in the next three years (Neumann, K., & Smith, R.,

2010). These panels will account for over 1,000 megawatts of energy in Ontario's grid (Neumann, K., & Smith, R., 2010).

The *Act's* repercussions are already being felt outside of the province's power generation and manufacturing industries. Real estate agents have begun to supplement their home sales by finding available farmland and large rooftops to lease for new wind and solar energy installations ("Ontario Solar News," 2010). A growing solar maintenance endeavour has been founded by firefighters looking to transition into other jobs ("Ontario Solar News," 2010). Companies who previously acquired commercial rooftops for cellular phone antenna towers have expanded to procuring rooftops for large solar energy developments ("Ontario Solar News," 2010). Further instances of the momentum created by the GEA can be found throughout the province, with roofers starting to install solar panels, commercial shelving manufacturers switching their shops over to build racks for solar panels, logistics companies taking on contracts to transport wind turbines and solar panels, construction crane operators finding work erecting wind turbines or aiding with rooftop solar projects and abandoned car manufacturing plants being converted into wind turbine plants and re-hiring former assembly line workers ("Ontario Solar News," 2010).

Another consequence of the GEA may be higher electricity bills for Ontarians. Some experts warn that electricity bills could rise by $110 by 2011 and continue to grow for up to five years after that and blame part of this growth on the GEA, specifically the FIT (Butler, D., 2010). The effect of the FITs on consumer's electricity bills is disputed by other experts due to the fact that power generated from FIT installations will account for a small portion of the Ontario's generating capacity in the near future (Butler, D., 2010). However, Hydro One, operator of Ontario's long-distance transmission lines has requested increases of 15.7 per cent and 9.8 per cent in 2011 and 2012, respectively (Butler, D., 2010).

6. Feed-in Tariffs

a) Explanation of Feed-in Tariffs

FITs are referred to as both "price guarantees" (Duff, D.G., & Green, A., 2007, p. 224) and "generation-based price-driven incentives" (Ragwitz, et al., 2005, p. 9) and involve a guaranteed price paid to renewable energy producers for the electricity they produce. The price is set by a national, or provincial, government who guarantees to pay a certain price for renewable energy for a specific period of time, typically between 15 and 20 years (Ragwitz, et al., 2005)(Mendonca, M., & Jacobs, D., 2009). Within the FIT model there are a few major variations.

Some early FIT regimes, such as California's Public Utilities Regulatory Act (PURPA) obliged utilities to pay approved renewable energy generators at a rate equal to the "avoided cost" of other electricity (Duff, D.G., & Green, A., 2007, pp. 224-225). This system functioned and provided favourable prices to the renewable producers due to the high oil prices at the time that PURPA was instituted (Duff, D.G., & Green, A., 2007, p. 225).

Another established model is variable rate FITs, of which there are two variations. One option is to base rates for renewable energy on market fees for electricity with renewable energy producers receiving favourable prices based on a percentage of the market price; whereas the other method pays a subsidy, or premium price, for renewable energy (Duff, D.G., & Green, A., 2007, p. 225). Variable rate FITs have been utilized in Spain, Denmark and Germany (Duff, D.G., & Green, A., 2007, p. 225).

Finally, there are fixed rate FITs, currently utilized in Germany, which guarantee a steady price for renewable energy production regardless of market price variations (Duff, D.G., & Green,

A., 2007, p. 225). The tariff rate in fixed rate schemes is based upon the generation costs of the renewable energy (Mendonca, M., & Jacobs, D., 2009).

There are also numerous other differences that are found within distinct FIT regimes. Specific technologies may receive different tariff rates, for example, in Ontario energy generated from solar installations receives a higher tariff rate than energy generated by wind power. Even within the same energy generation method, different installations may receive different tariff rates depending on their location. Some countries, particularly Germany, have sought to promote renewable use in areas with lower renewable energy yields by offering higher tariff rates for installations located in areas with less renewable energy potential (i.e., less wind or less sunlight) (Gipe, P., 2004, p. 213). So far, this strategy has only been used for wind energy (Mendonca, M., & Jacobs, D., 2009). These factors can even be calculated together, for example in Germany the rate paid for onshore wind power generation is between 5.0 and 9.2 Eurocents/kWh depending on the installation's location whereas solar Photovoltaic (PV) sites receive a maximum of 31.94 Eurocents/kWh if the installation is ground-mounted, but receive 43.01 Eurocents/kWh if installed on a home (Mendonca, M., & Jacobs, D., 2009). Some regimes even provide different tariff rates depending on time, i.e. depending on the season or according to base and peak load needs at different times of day (Duff, D.G., & Green, A., 2007, p. 226).

Numerous FIT regimes, in an attempt anticipate the future cost reductions of generating renewable energy due to technological improvements and in order to foster those improvements; have instituted a program of decreasing tariffs (Ragwitz, et al., 2005). Under this process, also known as tariff digression, tariff reductions are annual, but are applied only to new installations (Mendonca, M., & Jacobs, D., 2009).

b) A comparative analysis of feed-in regimes tariffs in European countries (Denmark, Spain, Germany)

i) Denmark

Denmark has a tradition of cooperative industry dating back to the 19th century when, in 1882, the country became the birthplace for the first dairy cooperative in the world which inspired agricultural cooperatives in almost every Danish village (Tranaes, F., 1997, p. 4). However, a different type of collective action helped to form the impetus for the wind energy industry in the nation. The "Danish model" sprouted from social activism that critiqued fossil fuel energy sources and refused to believe in nuclear power as a viable alternative (Szarka, 2007, p. 30). Throughout the 1970s this activist movement successfully resisted the Danish government's and utilities' repeated attempts to promote and impose nuclear power on the Danish populace (Szarka, 2007, p. 31). One of the most influential lobby groups for renewable energy, the Organisationen for Vedvarende Energi (OVE) evolved from the anti-nuclear organization Organisationen til Oplysning om Atomkraft (OOA) (Szarka, 2007, p. 31). OOA's search for non-nuclear energy options found wind energy as a strong alternative (Szarka, 2007, p. 31). Because of the widespread opposition during the 1970s, spearheaded by groups like OOA, the government's nuclear plans were temporarily shelved (Szarka, 2007, p. 31). By the mid-1980s the Danish government no longer had nuclear ambitions and the popular and widespread opposition to nuclear power was truly victorious, a unique situation in the developed world (Szarka, 2007, p. 31). The populist victory carried with it considerable consequences, including the acceptance of the idea that technology could be chosen by the greater Danish population instead of government technocrats (Szarka, 2007, p. 31). An enduring link was created between wind power advocacy and opposition to nuclear reactors, an important

development as opportunities for renewable energy, especially wind power, began (Szarka, 2007, p. 31).

Denmark's tradition of environmentalism and cooperation were social factors that may have played an equal role in the explosion of wind power in the nation (Mendonca, M., 2007, p. xv). The confidence gained from these victories encouraged the development of a "cooperative" wind power movement that also revitalised community spirit within Denmark (Szarka, 2007, p. 31). Activists envisaged "a self-sufficient local community with the idyllic village" (Szarka, 2007, p. 31). The Danish valuing of independence and self-help, coupled with collective organisations, made up essential components of the movement (Szarka, 2007, p. 31). In 1978 the Danish Windmill Owners Association was formed. The Association was born of informal gatherings between environmentalists and renewable energy enthusiasts (Szarka, 2007, p. 31). The Association has gradually become a potent lobby group, helping to effect legislative modifications that have further aided the wind partnership ownership structure (Bolinger, M., 2001, p. 12). Local ownership in Denmark took the form of a social contract and was instrumental in creating acceptance of the still-nascent wind power technology (Szarka, 2007, p. 31). The first wind turbines in Denmark were erected by private individuals who received no aid from the government, but collective ownership of turbines quickly became popular (Bolinger, M., 2001, p. 9). Initially, wind partnerships were entered into by local environmentalists attempting to take advantage of extant power and tax law (Bolinger, M., 2001, p. 12).

The implementation of feed-in tariffs in 1993 was instrumental in sparking even more growth in the production of wind energy in Denmark (Bolinger, M., 2001, p. 11). Danish parliament's stated goal with the formulation of FIT laws was to "encourage individual action toward meeting Danish energy and environmental policy"(Gipe, P., 2004, p. 212). By the mid-1990s

Denmark had 2,100 wind cooperatives which accounted for half of the country's total installed wind capacity (Gipe, P., 2004, p. 212). Almost 5 per cent of the Danish population, almost 100,000 households, owned shares in a wind turbine cooperative or *fallesmolle* (Gipe, P., 2004, p. 212). Recent opinion polls have shown that wind energy still enjoys strong popularity in Denmark with 70 per cent of the population (respondents) in favour and only 5 per cent against (Soerensen, H.S., et al., 2003, p. 2).

Before progressing with the analysis of the Danish situation, it should be noted that calling Danish wind power ownership groups "cooperatives" is actually a misnomer (Bolinger, M., 2001, p. 12). Danish law holds that wind turbines must be "directly owned by electricity consumers," thus prohibiting cooperatives from owning turbines (Bolinger, M., 2001, p. 12). The ownership structure that is commonly referred to as a "cooperative" is actually community ownership through the use of general partnerships (Bolinger, M., 2001, p. 12). This partnership consists of a contractual relationship connecting various electricity consumers who unite their resources to purchase turbine(s) (Bolinger, M., 2001, p. 12). These general partnerships are the lone form of joint ownership allowed by power law in Denmark (Bolinger, M., 2001, p. 12). This is not to say that cooperatives are not used in Denmark, they are, especially for combined heat and power, but not for wind (Bolinger, M., 2001, p. 12).

Wind partnerships in Denmark consist of individuals who have pooled their savings and buy a wind turbine and then sell the electricity to the local utility at a fixed rate (Bolinger, M., 2001, p. 13). The feed-in tariff was set at 85 percent of the production and distribution costs of the utility, but it was then standardized at 0.33 DKK/kWH under the newer transitional scheme (Bolinger, M., 2001, p. 13). Wind partnerships also receive a partial reimbursement of the energy tax (0.17 DKK/kWh) and a complete refund of the CO_2 tax (0.10 DKK/kWh) (Bolinger, M., 2001, p. 13).

Investors in a wind partnership still pay their electricity bills as they normally would and the electricity generated by the turbine is bought wholesale by the utility instead of being sold back to the individual partners (Bolinger, M., 2001, p. 13).

Another boon for those wishing to enter the community power market in Denmark is that the nation has certain "ethical" banks that lend money for wind turbine investment at below-market rates (Bolinger, M., 2001, p. 14). In one case, the interest rate offered to wind-turbine borrowers was 4%, as compared to the normal rate of 10%, as long as the borrower had had an account with the bank for at least six months (Bolinger, M., 2001, p. 14). In combination with these preferential loans, interest on loan's taken out to finance the purchase of shares in a wind turbine co-operative is tax deductable (Bolinger, M., 2001, p. 14).

In a further measure taken to promote individual and cooperative purchasing of wind turbines, the Danish government enacted laws exempting profits made from turbines from taxes on the fraction of the power that was used to offset a household's domestic electricity consumption (Gipe, P., 2004, p. 212).

Owning a wind turbine in Denmark is sometimes compared to having a pension plan as and the security of income is one of the reasons that in the mid-1990s most demand for wind turbines came from farmers who wanted to install individual turbines (Szarka, 2007, p. 30). This constituency created a wide ownership base, estimated to be between 120,000 and 250,000 people (Szarka, 2007, p. 30). It is accepted in Denmark that the high level of community ownership of renewable energy installations has been instrumental in fostering widespread social acceptance of the country's wind energy industry (Maegaard, P., 2008, p. 2). The widespread community ownership was matched throughout the 1970s, 1980s and even some of the 1990s by the resistance to wind

power that came from the large Danish utilities (Szarka, 2007, p. 30). Indeed, by the year 2000 only 15 percent of Danish wind capacity was owned by the utilities (Szarka, 2007, p. 30).

Although Danish utilities may not be heavily invested in wind power, large groups of private citizens have come together to spur grander installations. In Denmark a cooperative can have anywhere between twenty and a few hundred people (Szarka, 2007, p. 30). Cooperatives in Denmark even have stakes in large wind farms like the Middelgrund offshore wind farm (Wizelius, T., 2007, p. 21). The Middlegrunden Wind Turbine Cooperative is the world's largest wind turbine cooperative (Soerensen, H.S., et al., 2003, p. 2). The Middelgrunden installation is made up of twenty 2 MW Bonus turbines, half of which are owned by the 8,500 members of the cooperative (Soerensen, H.S., et al., 2003, p. 2). The majority of the cooperative's members live in the local area and most have invested 2,850 Euro, which corresponds to 5,000 kWh of production per year (Soerensen, H.S., et al., 2003, p. 2).

Because of noise and what some perceive as a reduced aesthetic quality of the landscape created by wind turbines, and that the beneficial aspects of wind energy are felt nationally and internationally, the Danish government ensured that only the locals feeling those effects were eligible to receive beneficial government subsidies (Bolinger, M., 2001, p. 13). Thus, wind partnerships were obliged to operate on a local basis and the government's strategy has done much to strengthen public support for the turbines and aid in establishing small wind partnerships throughout Denmark (Bolinger, M., 2001, p. 13). However, this model has gradually changed as Denmark seeks to become ever more reliant on wind power (Bolinger, M., 2001, p. 13). Ownership restrictions, which in the 1980s limited wind partnership investment to those residing within 3 km of the turbine, have expanded throughout the 1990s to residents of neighbouring boroughs and those who own property or work in a particular borough but don't reside there, to the present where

owners can reside anywhere in Denmark, or, indeed, anywhere in the European Union (Bolinger, M., 2001, p. 13). The regulatory change in the 1990s is credited as one of the key factors that ensured the growth of wind power in Denmark throughout the decade (Bolinger, M., 2001, p. 9). The change mentioned above was a regulatory measure that allowed a small parcel of land containing a turbine to be legally separated from the surrounding property and registered to a different section of real estate, even one situated a long distance away, thereby allowing a greater number of people, such as residents of urban areas or zones with inadequate wind resources, to become turbine owners (Bolinger, M., 2001, p. 9). Wind power cooperatives could buy a turbine, choose an optimal site and then sell the power to the local utility and share the returns (Gipe, P., 2004, p. 212). Thus, urban residents who weren't able to place a turbine on their own property could buy a larger, more cost-effective, turbine - one that would generate far more power than any one household could use – and install it in a rural area (Gipe, P., 2004, p. 212).

Denmark already generates 20% of its electricity from wind power, mostly due to the progress made under the FIT (Mendonca, M., 2007, p. xv). Unfortunately, the FIT was revoked in 2000 (Mendonca, M., 2007, p. xv). The law's demise was heralded by the deregulatory trend that swept the world in the early 2000s and reached even Denmark (Gipe, P., 2004, pp. 212-213). It should be noted that the FIT was not necessarily ended due to poor performance but was terminated rather due to the ascendant neoliberal ideology swaying the government (Gipe, P., 2004, p. 213). The Danish government moved away from a policy of percentage of retail price FIT model largely due to its desire to enact a more "market-based" policy instrument, one based on tradable green certificates, accompanied by diminishing government attention to renewable energy (Couture, T., & Gagnon, Y., 2010, p. 961). While community ownership has been an integral part of the growth of wind energy in Denmark, many fear that the end of the FIT scheme signals the death

knell for community power in that nation (Bolinger, M., 2001, p. 15). Since the abolishment of the FIT, wind turbine installation and production in Denmark has slowed dramatically and community wind power may be at an end (Bolinger, M., 2001, p. 15).

ii) Germany

Germany has been a leader in renewable energy for some time, in terms of total installed renewable capacity, technological and political (policy) innovation and the number of people working in the renewable energy sector in the country. 35,000 people work in Germany's solar industry alone, with more than 200,000 people working in the entire renewable industry in the country (International Energy Agency, 2007, p. 68). Germany generates 4.4% of its total electricity through wind power, placing it behind only Denmark and Spain for the greatest share in the IEA (International Energy Agency, 2007, p. 65). Since 2000 Germany's supply of renewable energy has grown by almost 12% per year, a total increase of 75% (International Energy Agency, 2007, p. 65). The renewable activists who spurred Germany's adoption of renewable shared many similarities with their Danish counterparts (Szarka, 2007). The antinuclear movement and the greater "green movement" in Germany had already attained great political influence when calls for renewables began (Szarka, 2007). In both Germany and Denmark support for renewable energy was connected with mass opposition to nuclear power (Szarka, 2007).

In 1991 Germany instituted the *Stromeinspeisungsgesetz* (the "electricity in-feeding law") which required utilities to indefinitely pay 90 percent of their annual average retail rate for energy purchased from renewable sources such as solar panels and wind turbines (Gipe, P., 2004). This legislation lead to an exponential growth in renewable energy, particularly wind energy, within Germany (Gipe, P., 2004). Alongside the FIT, numerous other measures were instigated to aid in the production of renewables, such as: a program funded by the federal government for research

into renewable that that supplied more than €1 billion; reduced interest loans for renewable projects from banks run by the federal government that lent more than €3 billion; reforms of the federal building codes to induce further renewable development; the institution of a public awareness campaign about renewable energy; and, new training programmes for architects (Mendonca, M., 2007, p. 29). Another effective measure that the government took was to amend the construction code so that all communities had to specify certain areas that were appropriate for the development of wind power, thus easing the permitting process for new wind installations (Mendonca, M., 2007, p. 29). Public awareness campaigns and new programmes for architects were also undertaken.

Subsidies for wind farm development were easily obtained and they, along with FITs, fostered a broad ownership base with significant numbers of community-centered citizens' wind farms, also known as *Burgerwindparks* (Szarka, 2007). *Burgerwindparks* usually consist of a wide range of local people owning shares in a wind farm cooperative, and the cooperative can be quite large (Toke, D., 2005, p. 305). One of Germany`s first offshore wind installations, with a capacity of roughly 240 MW is organized as a co-operative (Toke, D., 2005, p. 305). When referring to a citizens renewable energy collectives that is not just a wind park, ie. solar or biogas it is called a Bürgerbeteiligung (Gipe, P., 2007, p. 2). These Bürgerbeteiligung consist of citizens forming limited liability companies that solicit investment from local landlords and nearby communities for the express purpose of creating more renewable energy (Gipe, P., 2007, p. 2). Developers attempt to raise all the necessary equity from the local community and, if this is not possible, they expand their search to the local region and if they are still short of capital they offer investment opportunities to the whole country (Gipe, P., 2007, p. 2).

Although estimates do vary, in 2000 over 200,000 Germans were owners of wind farm shares and even large wind farms have been financed through investment funds whose shares have

been purchased by individuals (Szarka, 2007)(Gipe, P., 2004). In the region of Schleswig-Holstein it has been estimated d that 90 per cent of turbines are owned by private citizens (Szarka, 2007).

As of 2007 almost 8,000 MW of Germany's 20,000 MW wind capacity was owned by farmers (Gipe, P., 2007, p. 2). Another 2,000 MW (or 10 per cent) was owned by Bürgerbeteiligungs, bringing to 50 per cent the amount of German wind power developed by small investors and landowners, an investment worth almost $20 billion (Gipe, P., 2007, p. 2). The 50 per cent figure for ownership by farmers and local, non-corporate actors such as co-operatives remains unchanged from 2004, and since capacity has grown by 4,000 MW this demonstrates that smaller actors are still very involved with initiating new wind projects (Toke, D., 2005, p. 305).

In the former East Germany, and in other parts of Germany where the rural economy was faltering, small farmers were quick to recognize the economic aid that wind power could bring them (Szarka, 2007). German farmers not only own their own turbines, they often lease land to wind farm operators and these rents can form an important revenue stream (Szarka, 2007). It has been stated that "It was German farmers...and not utilities or wind farm developers, who launched one of renewable energy's most visible success stories" (Gipe, P., 2004). German farmers usually group together in informal co-operatives and slowly grow their joined installations until they have achieved overall installations of relatively large capacity (Toke, D., & Elliott, D., 2000). Other factors in the success of the German FIT, besides the initiative taken by farmers, have been the ease with which inexpensive consultants and agents of turbine manufactures can be accessed and the amount of information spread by local enthusiasts about how to set up commercial renewable energy installations (Toke, D., & Elliott, D., 2000).

During the 1990s attractive tax breaks existed that made individual investment in renewable energy public fund schemes an attractive option, but those tax breaks were removed in 2004 and their loss signalled a change in Germany's renewable sector (Szarka, 2007).

Wind farm ownership in Germany is more heterogenous than that found in Denmark in that the existence of large-scale wind farms necessitated the greater capital offered by financial consortiums (Szarka, 2007). Since Denmark has no large onshore wind installations, the involvement of large private actors has not become as much a part of the renewable energy landscape (Szarka, 2007). Since the mid-2000s large corporate investors have begun to control a greater share of wind portfolios making more owners distant shareholders with simply a commercial interest (Szarka, 2007).

The Bundestag (the German parliament) replaced the FIT law with a newer version in 2000, the Erneuerbare-Energien-Gesetz (EEG), or the Renewable Energy Sources Act. The goal of the EEG was to double Germany's renewable energy from 5 per cent to 10 per cent of total electricity supply by 2010 (Gipe, P., 2004, p. 213). One of the new developments in the law was that from 2002 onward all new projects would, after their 6th year, be paid according to how their performance measured up against a "reference site" (Gipe, P., 2004, p. 213). Sites that were projected to receive more wind than the reference site would receive less money, while those sites which received a smaller amount of wind than the reference site would be paid more (Gipe, P., 2004, p. 213). The FIT law was revised to ensure that wind turbines were built throughout Germany and not just developed in high wind corridors (Gipe, P., 2004, pp. 213-214).

Further changes brought about by the EEG include new provisions mandating that the FIT be examined every four years to ensure that over-subsidization of certain technologies is not taking

place (International Energy Agency, 2007, p. 29). FIT rates are set so that every technology will theoretically have equal footing and that investors will receive equal returns no matter what technology they invest in (International Energy Agency, 2007, p. 29). The amount paid to the producer is dependent on what year the facility was constructed, and depending on what technology is utilized, rates are guaranteed for a period of between 15 and 30 years (International Energy Agency, 2007, p. 69). The amount paid to each installation is set according to what year it becomes operational, but tariffs have a fixed digression rate, they decline annually, in order to compensate for technological advancements in each technology (International Energy Agency, 2007, p. 69).

The EEG also ensures that renewable energy facilities are guaranteed priority access to the grid, transmission and distribution, and grid operators are obligated to purchase power produced by the renewable facilities (International Energy Agency, 2007, p. 69). The country's feed-in tariff regime has been recognized as the impetus for Germany's rapid growth in renewable, but other policies, such as a reduction in biofuel taxes and strong government support for R&D in the renewable energy sector are also responsible (International Energy Agency, 2007, p. 73). The success of the German FIT has prompted the entrance of many new companies into the renewable energy market, thus establishing a steeper learning curve and helping to reduce costs (International Energy Agency, 2007, p. 73). The use of coal to generate power in Germany has shrunk considerably from 62 per cent in 1985 to 50 per cent in 2005 (International Energy Agency, 2007, p. 20). The largest growth in electricity generation over the past two decades has been in renewables which rose from 3.9 per cent in 1985 to 10.1 per cent in 2005 (International Energy Agency, 2007, p. 20).

Another factor that has been vital to the growth (and future) of renewables in Germany is the nuclear phase-out agreed to between the German government and German utilities in 2001

(International Energy Agency, 2007, p. 27). Nuclear power currently supplies 12 per cent of primary supply and 25 per cent of Germany's total power generation (International Energy Agency, 2007, p. 8). Reactors will slowly be shut down as they age and all plants should cease operations by 2022 (International Energy Agency, 2007, p. 8). Germany's current chancellor Angela Merkel had announced a reversal of this policy, but in the wake of the nuclear crisis in Japan Merkel went so far as to close down seven older reactors and to put off ending the moratorium for three months, after which the policy will be re-examined (Harding, L., 2011). Although estimates have shown that this phase-out can be completed without a resulting increase in GHG emissions, agencies such as the IEA have "strongly encouraged" the German government to reverse its position on the phase-out arguing that it will lead to decreased energy security and a greater reliance on fossil fuels (International Energy Agency, 2007, pp. 8-9). The majority of German citizens are in favour of the phase-out and do not have a favourable opinion of nuclear energy in Germany (International Energy Agency, 2007, p. 27).

Despite the success of Germany's renewable energy industry, the nation's policies are not without there detractors. While the IEA acknowledges that Germany's FIT has resulted in "rapid deployment" of renewable electricity capacity, it criticizes the tariff as being too expensive (International Energy Agency, 2007, p. 12). It is estimated that the FIT will cost EUR 68 billion between 2000 and 2012 (International Energy Agency, 2007, p. 12). Solar photovoltaic power, in particular, receives a large subsidy with 20 per cent of the total spent through the FIT going to solar but with solar only producing 5 per cent of the resulting renewable generation (International Energy Agency, 2007, p. 12). The IEA recommends that Germany "integrate" renewables with the complete electricity market, by reducing subsidies and promoting "market forces", which the agency

theorizes would lower costs and lead to the operation of "the right kind of facilities in the right places" (International Energy Agency, 2007, p. 12).

iii) Spain

Unlike Germany and Denmark, Spain's renewable advances have little to due with the success of locally owned renewable installations and pro-renewable Spanish energy 'activism' has manifested itself far less than in the two other countries (Toke, D., 2005, p. 306). Spain's success is (like Germany's) not due solely to its FIT policy, but rather to a "deeper commitment", consisting of various initiatives from government to promote renewable energy (Mendonca, M., 2007, p. 47). Spain's government crafted policies to specifically encourage ownership of renewables by utilities, but made sure to share the benefits of each endeavour with the local authority (Toke, D., 2005, p. 306). Most local benefits from renewable energy are passed on to the community in the form of local job creation and the payment of local taxes by energy producers (Garcia Ortega, J.L., & Menendez Perez. E., 2006, pp. 222-223). Another aid to the local economy is that wind developers are obliged to pay landowners, both private and public, a rental fee equivalent to 1.5 per cent of the total value of the electricity generated (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 222).

Spain's dependency on foreign energy imports, three-quarters of all Spanish energy needs are met with foreign supplies, has forced the Spanish government to look for ways to diversify its energy resources and produce more power locally (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 215). The oil shock in the 1970s served as a wake up call to the Spanish government which then founded the Centro de Estudios de la Energia (ERC; Energy Research Centre) and began to search for ways to bolster solar power in Spain (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 216). The ERC evolved into the Instituto de Diversificacion y Ahorro Energetico (IDEA; Energy Diversification and Conservation Institute) (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p.

217). The IDEA was a focal point for the advancement of renewables in Spain (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 217).

Alongside this government action, independent developers and civil society organizations are two of the key groups who have advocated for renewable energy within Spain (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 217). Independent developers formed umbrella organizations to consolidate their power as they were usually smaller than conventional utilities and focused on wind and small-scale hydro and wind power (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 217). Support for renewables and political pressure on their behalf was demonstrated by environmental and civil society groups, who saw renewables as a way to tackle energy-based pollution, preceded the widespread expansion of Spain's domestic renewable industry (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 217).

Germany and Spain have embraced renewable energy for quite distinct reasons. Whereas Germans are motivated to invest in renewable due, in part, to *Okologismus*, a willingness to sacrifice personally in order to secure gains for the environment, Spaniards are driven by the investment returns that FITs have opened to them (Mendonca, M., 2007, p. 57). The Spanish awareness and ideological commitment to renewables due to environmental concerns lags far behind their German counterparts, but this could be interpreted as more proof of the efficacy of an FIT system, in that it attracts both environmentalists and those interested solely for economic reasons (Mendonca, M., 2007, p. 57).

The Spanish electricity market was opened to nonutility renewable projects in 1997 and in 1998 Royal Decree 2818 (RD 2818) "on the production of Electric Power by Facilities Supplied with Renewable Energy Sources, Waste and Co-generation" was enacted (Mendonca, M., 2007, p. 49).

RD 2818 was a critical development for renewable energy in Spain and laid out tariffs for installations smaller than 50 MW and gave them guaranteed grid access (Gipe, P., 2004, p. 215).

In 2004 RD 2818 was replaced with a new Royal Decree 436/2004 (RD 436) (Mendonca, M., 2007, p. 49). The legal and economic framework for generating electricity was streamlined under RD 436 to remove some of the more complex elements and to make the system more dependable and predictable (Mendonca, M., 2007, p. 50). RD 436 created a system where the owners of renewable installations could opt for a "market" price which includes a premium or a fixed price guaranteed by the tariff (Gipe, P., 2004, p. 215). Almost all installation owners chose the fixed tariff, which was valued at 0.066 euro per kilowatt-hour (Gipe, P., 2004, p. 2004). The tariff was designed to approximate 80 to 90 percent of the typical amount paid for electricity (Gipe, P., 2004, p. 215). Once the FIT was enacted, wind capacity in Spain grew rapidly, ushering in a formidable wind energy industry within a decade (Gipe, P., 2004, p. 216). As of 2005 Spain generated 8% of its electricity nationally from wind power and this percentage is projected to more than double, to 20%, by 2013 (Toke, D., 2005, p. 306).

The growth in renewables occurred despite the fact that Spain, in comparison to many other districts with FITs (i.e. Germany), guarantees tariff levels for a short period of time, theoretically creating a higher risk level for investors in the system (Mendonca, M., 2007, p. 55). However, due to the Plan de Fomento de las Energias Renovables (Promotion Plan for Renewable Energy 2000-2010 – PER), which has now been replaced with 2005-2010 Renewable Energy Plan, a stable policy environment for investment in renewable has been demonstrated and has offered a surprisingly high degree of certainty to investors (Mendonca, M., 2007, p. 55). The investment security found in Spain, while real, is more 'informal' than what would be found in Germany (Mendonca, M., 2007, p. 55).

Another difference between the Spanish system and those found in Germany or Denmark, is that Spanish wind installations are immense compared to installations in the other two countries (Gipe, P., 2004, p. 216). This is due partly to differences in landownership and patterns of settlement between the three countries and partly because of the Spanish government's deference to its utilities (Gipe, P., 2004, p. 216). Utilities in Spain (and generally) are attracted to larger installations with greater economic potential, thus neglecting the construction of many smaller projects (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 225).

Numerous city and county councils have founded their own energy agencies in an attempt to promote local renewable energy sources (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 218). City councils have also been key: i.e. Barcelona's 'solar ordinance' which mandates that solar thermal collectors with the capacity to provide at least 60 per cent of a building's hot water needs must be installed in all new and refurbished buildings in the city (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219).

The high unemployment rate (10-20% in some regions) has been a major factor in involving Spanish states in the renewable energy industry (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219). Regional governments in Spain oversee the installation of renewable energy projects in their own territory and have various distinct approaches to planning (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 222). These regional governments have gotten involved with renewable energy with the express purpose of bolstering their local economy and many have decided to demand that in order for companies to qualify for the approval of new renewable installations they make investments that will directly benefit the local economy, such as the utilization of domestically manufactured turbines (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219)(Gipe, P., 2004, p. 216). Galicia has had a huge wind objective and it has been linked to the goal of guaranteeing that

70 per cent of the investment in wind is invested inside state borders (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219). This initiative has created more than 5000 direct and indirect jobs and various facilities (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219).

States have also engaged in environmental issues in an attempt to ease the acceptance of renewables by the local populace (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219). The state of Navarra requires that environmental factors be considered at the outset of any planning and site identification for renewable installations (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219). This measure circumvented some of the conflicts concerning the siting of renewable installations that arose in other states and delayed certain projects (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 219).

Due to its sparse rural population, at least in regards to north-western European nations, and the fragility of its rural economy, there is little opposition to rural wind installations in Spain (Toke, D., 2005, p. 306). However, there have been accusations that these impoverished rural regions are being "sold out" to external renewable energy interests, despite the essential investment these outside parties have bestowed upon rural areas (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 224).

Even after the royal decree of 2004 (meant to create more incentive for renewables in the liberalized energy market and providing investor confidence through longer-term insured premium payments) there continue to be issues vital to smaller, independent developers that have yet to be resolved (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 218). These independent producers have therefore lobbied the government elected in 2004 to restructure parts of the law that unfairly

punish smaller producers, and create greater incentives for biomass (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 218).

Further barriers to renewable energy in Spain include lack of financing, insufficiently trained personnel, contradictory regulations in other sectors as well as a deficiency in "cross-sectoral policy integration" (Mendonca, M., 2007, p. 53). One noticeable obstacle is the fact that producers of renewable energy must pay for their own connection to the grid (Mendonca, M., 2007, p. 53). In Germany, utilities pay the connection costs for renewable facilities and then pass those costs on to energy consumers through their electricity bills (Mendonca, M., 2007, p. 53). Investment priorities are also a problem; traditional generators are still sometimes valued over 'alternatives' (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 221). Unfortunately, this has lead to a situation in which many of the central renewable energy proponents are third parties, who are not part of the extant power industry and have little influence over it (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 221). Because of this, there is a negative dynamic between many renewable energy promoters and utilities who feel they are in competition; utilities have even been accused of withholding grid access to create obstacles for renewable installations (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 221). The Spanish government has acceded to the larger traditional utilities and placed limits on the total amount of wind energy that the grid will accept (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 221). This was included as a last-minute annex in the Energy Infrastructure Plan (Mendonca, M., 2007, p. 221). While state and national Spanish the governments have created various agencies and organizations to aid in the growth of renewable, government actors in Spain have generally still favoured "traditional" energy generation over renewable options (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 224).

This has resulted in the Spanish government issuing contradictory signals with its various energy plans (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 224). This contradiction was encapsulated in the replacement of the 1999 Plan de Fomento de las Energias Renovables with the Plan de Infraestructuras Energeticas (Energy Infrastructure Plan*) 2002-2011 (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 225). Of the two plans, the former advocates for renewable energy while the latter focuses on fossil fuels as the basis of Spain's power generating system (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 225). The promotion of renewable and conventional energy generation in energy planning, often with one at the expense of the other in, is especially confusing for long-term energy development (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 225). Spain still lacks an integrated plan for energy system development that combines both energy efficiency and renewable and gives equal treatment to all energy options (Garcia Ortega, J.L., & Menendez Perez. E., 2006, p. 225). A new royal decree has altered some elements of the FIT, but Spain's lack of enthusiasm for aiding community power organizations has remained unchanged (del Rio Gonzalez, P., 2008).

c) Conclusion

The experiences of Denmark, Germany and Spain demonstrate that the existence of an FIT in a given country or region is not enough to spur the growth of community power. All three nations had healthy FIT regimes, but Spain suffered from a clear lack of community power whereas there was a healthy preponderance of community involvement in both Denmark and Germany. Government must actively craft policies to draw-in individuals and smaller community groups if community power is going to thrive. Spain actively courted large power utilities at the expense of smaller community groups and established conditions unfavourable to community power, so it is conceivable that a successful community power industry could develop without all of the aid

proffered by Denmark and Germany as long as it was not actively discouraged as it was in Spain. However, it seems likely that in order to ensure the success of community power in a given region governments must institute specific provisions within the FIT regime as well as policies and incentives in other areas that are designed to bring community actors into the field of renewable energy development.

The strong tradition of social activism and environmentalism found in both Danish and German society was another catalyst for successful community power. Spanish environmental groups did lobby for the implementation of an FIT, but Spanish interest in a strong renewable industry was fostered more out of a need for renewable energy's economic benefits. Community power was also aided by the Danish moratorium on nuclear power and Germany's legislation phasing out nuclear reactors, as well as the strong involvement of anti-nuclear activists in the community power industry in both countries.

Ownership of wind power installations and renewable energy generation throughout the German and Danish populations is more widespread than in Spain, and has helped to ensure the continued popularity of renewable energy in both nations. However, ownership over renewable generation in Germany is concentrated in fewer hands than in Denmark due to the preponderance of large-scale German wind farms that require large sums of capital and are therefore more likely to be owned by larger corporations. Corporate ownership over wind power in Germany has increased dramatically since the mid-2000s whereas Denmark's wind industry has maintained its community roots to a greater degree.

Spain's pattern of renewable ownership is even more homogenous than that of Germany, but a sparse rural population and an economy desperately in need of any kind of stimulation have

contributed to the creation of laws ensuring that states and municipalities are the direct recipients of many of the economic benefits brought by renewable energy. These laws include measures such as the requirement that a certain percentage of parts of any wind installation have to be manufactured in the state in which it is going to be implemented have helped to ensure that opposition to renewables has not spread throughout the populace. Governments in all three countries attempted to address local concerns about renewable energy in order to aid in the acceptance of the new technologies.

Alongside addressing local concerns over renewable generation the policies used in Denmark and Germany that seem to have done the most to foster community power include: tax breaks for owners of renewable installations; favourable loans for renewable energy projects; and, public awareness campaigns about renewable energy.

While Spain has created a powerful renewable energy industry in an impressively short amount of time, it stands slightly apart from the other two European nations in that the country's deference to large utilities and traditional power generation methods has created problems. Utilities have been known to withhold grid access for renewable installations, as opposed to in Germany where a right to grid access exists for all renewable projects, and the Spanish government has capped how much energy certain types of renewables can feed in to the grid, due to aggressive lobbying on the part of some utilities. Further distinctions between Spain and Germany include a lack of financing and trained personnel and the fact that renewable energy producers must pay to connect to the grid.

The European examples demonstrate that FIT regimes and renewable energy can succeed using different types of structures but that for a community-based renewable industry to thrive,

there are certain steps and similarities that are, if not necessary, extremely helpful. These steps and similarities include: the presence of a culture or community of activists that is interested in the environment and in forwarding the cause of renewable energy; making favourable loans available to community power groups; giving favourable tax breaks to owners of community power; addressing local concerns about renewable installations; establishing public awareness campaigns about renewable energy; taking steps to ensure that there are enough trained consultants to aid community renewable project; and, not promoting the interests of large utilities over smaller producers and community groups.

7. Elements of European FIT Regimes that should be Applied in Ontario and a Comparison of European and Ontario FIT Schemes

As discussed in the previous section, the experiences of Denmark, Germany, and Spain demonstrate that the existence of an FIT system in a given country or region is not enough to spur the growth of community power. All three nations had healthy FIT regimes, but Spain suffered from a clear lack of community power whereas there was a healthy preponderance of community involvement in Denmark and Germany.

There are various lessons that Ontario can learn from the three European examples. One of the most important lessons is that Ontario's provincial government must institute specific provisions within the FIT regime as well as policies and incentives in other areas that are designed to bring community actors into the field of renewable energy development if there is to be a surge of community power in the province.

The policies listed in the conclusion to the previous section that were extremely helpful in ensuring a successful community power industry in Denmark and Germany should be implemented

in Ontario as well and include: tax breaks for individuals and cooperatives that own or invest in renewable energy installations; making interest on loans taken out to finance the purchase of shares in a renewable energy co-operative or community power venture tax deductable instituting public awareness campaigns about the benefits of renewable energy and how to get involved; measures to address local concerns over renewable installations (such as noise from wind installations) and to ensure that local benefits (i.e. profits from renewable installations) are reserved for local owners; and, direct government subsidies to community power groups in the process of building a renewable installation.

Establishing favourable loans for community power groups was also very helpful in both Denmark and Germany. Canada does not have an exact equivalent to Denmark's "ethical" banks, but perhaps one of Ontario's credit unions could be convinced to offer slightly more favourable loans. Germany's policy of favourable government loans may be more applicable in Ontario and would certainly aid community power in the province.

The three European nations have also shown that there are factors outside the government's purview that affect community power development within a region. Denmark's and Germany's cultures of environmentalism and anti-nuclear activism, combined with the Danish culture of independence and the German notion of *Okologismus* were instrumental in the creation of a viable community power industry in both nations. Canadian culture may not react equally to the opportunities provided by the FIT. However, Germany's farmers, while influenced by the notion of *Okoligismus* also took part in the FIT for financial reasons and helped to spur community power growth in the country and a sizable percentage of Ontario's farmers also seem eager to reap the benefits of the province's FIT regime, so perhaps cultural differences are not an insurmountable obstacle to the establishment of a strong community power industry. Ontario may not be home to

the same level of activism, but the province is home to many environmental groups, and the creation of the GEA, and the lobbying that lead up to the introduction of the Act, indicates that there is a base of interested individuals that could be built on. A concerted campaign of public awareness on renewable energy spearheaded by the government, similar to the initiative carried out in Germany, implemented in a way that speaks to local communities and addresses their questions and concerns could be instrumental in expanding the necessary cultural base.

Alongside the public awareness campaigns conducted in Germany, the government took steps to ensure that qualified consultants were available to help with community energy projects and went as far as sponsoring university programs geared towards preparing students to work with renewable energy to make sure that there were enough qualified workers to help build the installations. The lack of sufficiently trained personnel was a barrier to renewable energy in Spain and could have a greater effect on community power groups as they might not have the resources to bring in workers from other areas or know how to locate qualified personnel outside of their immediate region.

Local German renewable energy enthusiasts worked to spread information about renewable throughout their communities and were an important resource for community power in that nation. Ontario may lack this type of information spreading compared to Germany, but it is conceivable that the GEA could act to cultivate a group of such enthusiasts in the province.

Denmark's ban on nuclear facilities and Germany's cap on nuclear power aided investment in renewables as a whole as well as leaving more room for community power and helping to shift the focus away from grand power installations. Ontario could learn from this policy and curtail the province's continued focus on nuclear generation, although this seems less and less likely.

Spain's example demonstrates that if governments neglect to nurture community power by actively favouring large utilities, smaller community energy groups will have a more difficult time establishing themselves in the region. As discussed in the section on Ontario's energy situation, a focus on large installations (particularly nuclear) is precisely what the Ontario government seems to be doing and this does not bode well for community power in the province.

Another obstacle to community power in Spain is the fact that renewable energy producers must pay for their own connection to the electricity grid. In contrast to Ontario, Germany and Denmark, Spain does not have a fixed term for its FIT contracts. However, while secure contracts of a certain length were key in Germany and Denmark, Spain has demonstrated that if there is enough confidence in the FIT regime as a whole, then fixed-term contracts are not a necessary requirement to spur investment in renewable energy.

A final difference between Spain and Ontario is the sparseness of Spain's rural population. The lack of a rural population has been cited as one reason that the construction of large Spanish renewable installations did not generate significant opposition among the country's rural population. Ontario has experienced a significant rural backlash to large wind installations and this could be due to a greater density in the rural population in the southern section of the province. Germany and Denmark however, did not experience a rural backlash to the same extent as Ontario and this appears to have been due to specific measures taken by their governments and the significant involvement of community groups in renewable installations. As discussed earlier in the paper, if a renewable project is undertaken by a local community power group then local resistance to the project is lowered significantly. Ontario may be able to address its problem of rural resistance by stimulating further community power initiatives in the most hostile parts of the province. Another measure taken by Spain and Ontario as well that should work to reduce local resistance to

renewables is a requirement for renewable installations to have a certain percentage of their parts manufactured locally. As stated earlier, under section 2.1 (e) of Ontario's FIT rules, a company must have a portion of the parts for a renewable installation manufactured in Ontario to qualify for Ontario's FIT.

Another feature of Ontario's FIT Program that could aid community power is the division of the regime into two streams: FIT and microFIT. FIT is designed for renewable projects over 10 kilowatts and microFIT for projects below the 10 kilowatt mark ("Ontario's Long-Term Energy Plan," 2010, p. 29). The rules and rates for microFITs are slightly different than those for FIT projects and are meant to encourage homeowners and small business owners to get involved and generate part of their own power ("Ontario's Long-Term Energy Plan," 2010, p. 29).

Two unique elements of the German FIT may be useful in Ontario. As outlined in the section on the German FIT regime, after their 6th year, renewable installations in Germany are compared to a "reference site" and paid accordingly. Based on projections of future energy generation at the site, installations that would generate more energy than the reference site would receive less money and sites that would generate less energy would receive a higher tariff. This system was instituted to spur renewable development throughout the country and not just in optimal areas that would generate the most power. This reference installation could be used in Ontario to spur development in out of the way and less profitable or smaller installations and thus induce communities with sub-optimal wind or solar resources to construct their own installations and thus promote community power.

Another interesting element of the German FIT scheme is that the system is to be reviewed every four years to ensure that certain technologies are not over subsidized and that the country is

responding accordingly to advances in renewable technology. This has lead Germany to include a "degression" measure in its FIT regime which reduces FIT rates for new installations by a pre-set amount each year to account for improvements in renewable technology (Sustainable Prosperity, 2010, p. 9).

Ontario's regime is supposed to be reviewed every two years, but does not include the same type of degression used in Germany, although Ontario does pay different tariff rates for different types of renewable technologies. Two other measures instituted by legislators to complement the German FIT scheme that are beneficial to community power groups are a guarantee that renewable energy producers will have priority access to the grid, transmission and distribution and that operators of the grid must purchase power produced by renewable installations (International Energy Agency, 2007, p. 69).

8. Possible Amendments to Ontario's FIT Regime that would aid Community Power Investment in Renewable Energy

Many of the amendments suggested in this section are adapted from successful ideas implemented in the European FIT schemes discussed in the preceding sections, but the suggestions also attempt to address Ontario's unique situation. As demonstrated in Europe, the mere existence of an FIT scheme is not enough to ensure the successful growth of community power and these suggested amendments would hopefully work to ensure a robust community power industry in Ontario.

One change to the *Green Energy Act* that would aid community power groups in the province would be to amend section 35 of the *Act* so that it would direct the Minister to establish a program that would help to finance community power groups in the crucial launching stages of a renewable

energy project. As suggested by MPP Peter Tabuns, the program would provide various types of grants and soft loans to community power groups that would require funding to account for the costs of the early stages of project development, including "pre-feasibility grants, capacity-building grants, feasibility loans and project development loans"; capitalization loans to community power initiatives to create easy access to low-cost loans in order to allow community power groups to retain ownership and control over their projects; and, capacity-building support for community power groups that require additional aid to construct the "financial, technical, social, legal and organizational templates and practices associated with the facilitation and development of locally owned community based renewable energy...projects" (*Official Report of Debates (Hansard)*, 2009, p. 696). The current section 35 of the *Act* does address these issues to some degree, but this amendment would concretize the Minister's obligations to a greater extent and improve the chances of success for community power in the province.

A further amendment to the Act should be the addition of a section allowing community power groups interested in constructing renewable energy installations to have access to easily obtainable low-interest loans. Since Canada does not have the "ethical banks" that carried out this function in Denmark, nor an exact parallel to the government funded banks in Germany, the loans could be financed by implementing a green bond program in the province. Section 8 of the Act could be amended to direct the Minister to establish and implement a green bond program through which the government issues bonds the revenue from which could be loaned to community power groups at low-interest for the purposes of constructing renewable energy facilities. The Committee Chair David Orazietti was careful to note that according to legislative counsel such an amendment is within the scope of the *Act* and would not constitute part of a "money bill" and therefore would not

require special consideration by the provincial government (*Official Report of Debates (Hansard)*, 2009, p. 697).

Another amendment to provincial legislation that would facilitate the growth of community power would be to restructure Ontario's FIT regime to take into account the innovations already pioneered in Germany. As detailed previously, Germany's FIT regime not only pays different rates for different types of renewable generation (as is already done in Ontario), but distinguishes between and pays different rates to, installations that located in areas with greater or lesser exposure to natural renewable energy resources. Facilities located in areas with sub-optimal amounts of wind or sun, for example, receive a greater tariff than installations in energy-rich locations. This amendment, emulating Germany's current FIT regime, could be implemented by amending the definition of "feed-in tariff program" in subsection 25.35(3) of the Electricity Act, 1998 and could be used to spur the growth of renewables even at sites that may not receive the optimal amount of energy from natural resources. The amendment would encourage diverse and dispersed investment in renewables throughout the province and could provide out-of-the-way communities with the impetus needed to construct their own renewable installations.

An additional amendment to legislation related to the Green Energy Act that would aid the cause of community power in the province would be granting community power groups a right of first refusal for the purchase of any other community power renewable installation that goes out of business. The legislative revision could be implemented by amending section 79.1 of the Ontario Energy Board Act, 1998 (*Official Report of Debates (Hansard)*, 2009, p. 719). The change would help to ensure that community power installations stay in the hands of community power groups and that community groups have the opportunity to take advantage of earlier work done by their counterparts.

There are a variety of further legislative amendments that could help spur the growth of community power in Ontario. An amendment to the provincial tax code allowing for a tax rebate on the provincial portion of income tax for individuals who have invested in community renewable projects would encourage individuals and partnerships to invest in community power projects. Another amendment to the tax code could be enacted to implement an initiative that was successful in aiding community power in Denmark: a law exempting profits made from renewable energy facilities from taxes on the fraction of the power used to offset a household's domestic electricity consumption (Gipe, P., 2004, p. 212).

Granting community based power operators priority access to building renewable facilities on crown lands would also be a boon for the community energy industry. An amendment could be made under Schedule A of the Green Energy Act stipulating that if a private developer identifies a project that they want to develop on crown land, local community power groups should be given the right of first refusal if they are prepared to build a similar project.

Another legislative manoeuvre that would aid community power in the province would be to give priority access to the grid to community power renewable projects over projects headed by larger corporate actors. This could be carried out by an amendment to section 26(1.2) of the *Electricity Act, 1998* and would ensure that community projects are not crowded out of the electricity market.

Two final initiatives that could be undertaken by the provincial government that would aid community power in the province and are beyond the power of community groups to implement would be to initiate a series of public awareness campaigns discussing renewable energy and the

opportunities presented by community power in Ontario as well as implementing training programs, in various levels of education, for the workers needed to sustain a renewable energy industry.

The amendments suggested for Ontario will not guarantee a robust community power industry, but they will increase the chances of community participation in renewable energy generation and perhaps ensure the success of renewables as a whole in the province.

9. Analysis and Conclusions

Due to the growing threat of climate change and rising GHG emissions it is clear that some type of mitigation strategy must be implemented. GHG mitigation strategies may negatively affect the world economy, but it has been persuasively argued that a lack of action to control climate change will result in greater global economic harm in the future. A lack of action may also result in catastrophic human cost.

To avert the worst effects of climate change society-wide macro-mitigation policies should be implemented, but there is also a need for narrowly targeted policies whose goal is to reduce human dependence on carbon generating technologies such as most current power generating facilities. Greater utilization of renewable energy generation is one way of reducing society's dependence on carbon-generating power installations and has been accepted as a viable mitigation strategy.

Detractors of renewable energy claim that it would be impossible to implement enough renewable power to fully displace traditional energy generation technologies and that even if it were possible to implement the vast quantities of renewable installations necessary to replace older technologies, the costs would be prohibitive. Advocates of renewable energy technologies refute both of these claims and argue that it would be difficult, but possible, to implement enough

renewable energy to replace older technologies. Furthermore, renewable advocates posit that if the "perverse" subsidies given to oil and coal companies were directed towards renewable technologies instead, much of the price difference between "clean" and "dirty" energy technologies would disappear. Proponents of renewable energy also argue that hidden costs of carbon-based technologies, such as the negative health effects of coal-fired power plants, are not taken into account when calculating the costs of different types of power generation. Advances in renewable energy technology continue to increase the energy output of renewables as well as making them more cost effective. Finally, advocates of renewable energy argue that the possible consequences of climate change are so dire that cost should not be the only consideration when determining what policies should be instituted to mitigate the effects of global warming.

While the implementation of society-wide policies to combat climate change is necessary, micro-policies also have an important role to play in any mitigation strategy. The implementation of greater renewable energy generation is one such strategy. Replacing "traditional" energy sources with renewable ones is a viable method of mitigating GHG emissions and will aid in halting global climate change. This method is both economically feasible and practically attainable and the implication for Ontario is that the province should work to foster greater development of renewable energy within its borders.

However, even the construction of renewable energy may not always be sustainable. Sustainability, as envisioned by Gibson, is not focused only on economic benefits or even solely on the mitigation of GHGs, but on implementing policies that will, in addition to the proceeding goals, have a positive social impact. Gibson posits that effective sustainable strategies take into account the interconnectedness of economic, social and ecological factors that come together in distinct ways in different localities. Gibson's criteria for determining whether a particular policy goal or

policy instrument is sustainable include examining: socio-ecological system integrity, livelihood sufficiency and opportunity, intragenerational equity, intergenerational equity, resource maintenance and efficiency and socio-ecological civility and democratic governance, precaution and adaptation, and immediate and long-term integration. Following Gibson's sustainability criteria, all of the preceding factors must be taken into account as a cohesive whole, rather than in isolation. Adopting Gibson's criteria lead to the conclusion that the costs of development should not be the only criteria for development. In order to pursue truly sustainable development and energy policies, Ontario should implement measures that take into account the holistic methodology of Gibson and ensure positive outcomes in a variety of ways for the province's communities.

In order for renewable energy to truly conform to the sustainability criteria outlined by Gibson it should be instituted by community organizations, creating a community power industry. Not only does community power adhere to Gibson's criteria, it has the added benefits of reducing local resistance to renewable projects, keeping more capital within the local economy, and creating a political support base for renewable energy generation.

This is not to say that community power is the perfect vehicle for the construction of renewable energy. One alternative to community power initiatives is the creation of renewable energy installations by larger, corporate entities. Corporate initiatives do have some advantages when compared to community power, such as greater access to capital that may allow them to construct renewable energy installations at a more rapid pace than if they were being constructed by community power groups. However, as Gibson made clear, there will be inevitable trade-offs in any endeavour, and almost every undertaking will carry both sustainability gains and losses.

If it is acknowledged that every strategy inherently contains positives and negatives, the myriad benefits of community power override its disadvantages and warrant crafting a policy instrument that encourages the growth and supremacy of community power groups to construct renewable energy. The inference from these conclusions is that Ontario should undertake actions to foster not just the growth of renewable energy in the province, but to create a renewable energy industry with a significant community power element.

In order to encourage the growth of community power, and renewable energy in general, certain policy instruments should be implemented. There are various ways to spur the growth of renewable energy in a given jurisdiction, but the two policy instruments that are seen as the most viable options are the "quota" system and feed-in tariffs. Both systems have various permutations, but retain certain key features throughout all of their incarnations. FITs involve governments paying a certain set rate for renewable energy generation to increase investor confidence, thus leading to greater investment in renewables. Under a quota system the government sets a minimum share of energy that must be generated by renewable means or energy capacity that must come from renewables. The portion of energy that must be renewable increases over time and the scheme usually involves a set end-date and specific targets for renewable generation.

Although quota systems have been championed as being theoretically more cost effective than FIT schemes, FIT regimes have resulted in the construction of more actual renewable energy installations and have been instrumental in creating powerful renewable industries in various European countries, including Denmark, Germany and Spain. Despite the theoretical attractiveness of quota systems, one of the major considerations when selecting a policy instrument to aid in the achievement of a policy goal is whether the instrument successfully accomplishes its stated objective, in this case the creation of more renewable energy. When applying this and other criteria evaluating

policy instruments it becomes clear that FITs are a preferable instrument to quota systems. Ontario's provincial government has already reached this conclusion.

Ontario has recently implemented an FIT scheme and passed the Green Energy Act in order to, among other things; incite further growth of renewables in the province. However, the provincial government has been giving mixed signals about where it intends to take Ontario's energy system, trumpeting the Green Energy Act and renewable energy while simultaneously insisting that nuclear power will constitute a considerable portion of the province's power supply for the foreseeable future. Ontario's recently released long-term energy plan does leave some room for renewable energy, but also makes it increasingly clear that the provincial government values a strong nuclear industry in the province over a robust renewable industry.

The government's decision to support nuclear power as Ontario's main energy source does reduce the chances of a community power industry becoming a force in the province, but there is still a chance, however slim, that nuclear energy will not make up the backbone of the power generation in the province. The unfolding crisis in Japan, the extremely high cost of constructing new reactors and the murky future of AECL are all factors that may prevent the continued dominance of nuclear power in Ontario. Ideally, the province would focus on renewable generation and energy efficiency initiatives as well as combined heat and power and not replace aging reactors with new nuclear development. However, even if nuclear power does end up generating the 50% of provincial power that is projected and proposed by the government's long term energy plan, renewables will have a part to play in Ontario's energy mix and community power initiatives may still be able to carve out a piece of the renewable energy pie.

A moratorium on nuclear generation in Denmark, and a halt to the construction of new nuclear facilities in Germany, was a key element of renewable energy's success in the two European nations. The experiences of Spain, Denmark and Germany with FITs, renewable energy and community power provide valuable lessons to Ontario. Danish and German culture were instrumental in the growth of a viable community power industry in both countries while the Spanish government's focus on aiding large utilities worked to prevent the establishment of community power in that country. Along with an active population interested in renewable energy, both the German and Danish governments crafted a suite of policies to complement their FIT regimes and this multi-policy strategy was another key to the success of renewable energy and community power in those nations. The lessons of the European FIT experience for Ontario are that there are various ways to achieve success in the fields of community power and renewable energy, but that certain similarly crafted policies can have a very positive effect on the development of both initiatives. All three European nations demonstrated that a robust FIT scheme alone is not sufficient to ensure the success of renewable energy. A suite of complementary policies should be instituted to aid in the growth of renewables. The leadership shown by Germany and Denmark in the field of community power, and Spain's lack of it, similarly demonstrate that a variety of policies are necessary to encourage the growth of a healthy community power industry.

Taking into account the lessons of the three European nations as well as Ontario's own particular situation, it appears that it may be more difficult to spark a successful community power industry in the province. However, the creation of such an industry is by no means out of the question, and there are certain legislative amendments that could give community power the impetus it needs to establish itself in the province. The amendments that should be made to Ontario's FIT

regime and other provincial policies that should be implemented to encourage community power in the province are detailed in the following section.

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