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Local Content Requirements
in British Columbia's Wind Power Industry

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EXECUTIVE SUMMARY

Local content requirements (LCRs) are regulations that specify a defined proportion of a final good be produced within a specific jurisdiction. They have been used in various industries to help promote domestic development and are currently being used by the wind industry in countries including Canada, China, Spain, Brazil, India, Australia and Portugal with varying levels of success.

These regulations are usually introduced to increase domestic manufacturing employment benefits from products consumed domestically, and to take advantage of technology transfer. However, they can also lead to inefficiencies and stasis by limiting the ability to exploit economies of scale, thereby increasing costs to consumers. Additionally, financial incentives are often paired with local content requirement policies to help overcome economies of scale and related concerns, which can result in increased local taxpayer costs. It is important to note that LCRs are industrial policies, not environmental, and without appropriate incentives, they can reduce investment in the given industry.

Before considering implementing a local content requirement policy, a jurisdiction must meet two important conditions. The first is the requirement of a sizeable and stable home market. The second is having policy measures in place that are clear and consistent in order to reduce risk for investing firms.

British Columbia (BC) currently obtains over 90% of its energy from hydropower, but it has recently begun exploring wind power as another source of clean energy. There is currently one operational wind farm in the province which came online in 2009 with a wind capacity of 102 MW, another with 144 MW capacity set to come online in March 2011 and six other farms that have been contracted through energy purchase agreements with BC Hydro. The total wind capacity that is either currently installed or contracted in the Province amounts to 782 MW.

To date BC has little to no wind turbine manufacturing capacity. With the cost of turbine components making up 70% of the total capital investment of wind farms, and manufacturing currently occurring overseas, it has been suggested that BC is not currently reaping the full economic rewards that wind farm development could provide.

BC's Clean Energy Act, 2010 sets a hard target of clean electricity by 2020. This will likely require increased investment in wind energy in the province, and an opportunity for BC's economy to benefit from job creation if appropriate policies are in place.

This paper looks in depth at LCRs imposed on the wind industries in Québec, Ontario and Spain and the results of these policies in terms of industry reaction as well as employment growth. If BC were to implement a local content requirement, Québec's policies, although strict, would be the best example for British Columbia to follow. Québec has set clear and consistent wind energy policies and LCRs that have attracted industry confidence and investment, thereby providing jobs in parts of the province that have historically struggled with high unemployment. In contrast, Ontario is using Feed-in Tariffs (FITs) as an incentive to stimulate the development of wind power. Spain combines both FITs and regional LCRs, an approach that has led to enormous industry development and growth.

World Trade Organization rules surrounding local content policies must be considered, however. Although many countries have, up until now, benefited significantly from local content require-

ments, it seems likely that this era may be coming to an end with formal trade challenges towards Ontario's policies initiated by Japan and now seconded by the US and the EU.

This unclear legal situation coupled with the inefficiencies that local content policies create in the development of wind farms and manufacturing, leads us to recommend that BC not go forward with a local content requirement policy. Doing so would result in overall energy cost increases to consumers, which is in direct violation of the stated mission of BC Hydro.

If BC wants to encourage further development of its wind industry at this time, it is advisable to look into other direct and indirect approaches such as financial and tax incentives, research and development funding, mandatory renewable targets and guaranteed energy purchases. If BC is serious about stimulating green energy, the province would do best to entrench stable and specific policies that promote clean technology.

1.0 INTRODUCTION

With the increased awareness of global warming, many governments around the world, including British Columbia's, have enacted legislation to promote clean energy projects. Another driver has been the desire to benefit from the emerging global "green economy", with some governments implementing supplementary policies to further benefit their local economies. One such policy is a local content requirement, which mandates that a certain percentage of a product be sourced in the jurisdiction in which it is sold.

British Columbia has set many ambitious targets toward decreasing its carbon footprint. The province's emphasis on renewable energy, when coupled with BC's abundant wind supply, offers fertile ground for the wind energy sector.

From a supply-side perspective, BC has ample wind resources, with nearly 16 gigawatts ("GW") of potential wind capacity that could be exploited by wind turbines, with 9 GW being considered readily-available.[1] While the cost of wind farms can vary greatly, the cost to manufacture turbines sufficient to utilize this total potential could be well over $30 billion.[2] Even if wind companies were only to pursue BC's 9 GW in "readily-available" wind generation capacity, this would still result in a capital investment of roughly $18 billion.[3] While mandating that a portion of the manufacturing be done in BC would create local jobs, this policy could also raise costs for energy consumers across BC.

This paper examines the viability of instituting a local content requirement in BC's wind energy sector. These requirements would ensure that BC businesses gain direct benefits as suppliers to the wind turbine manufacturers. Yet, the decision to implement a LCR involves many complex factors. This paper analyzes four areas in approaching this issue:

- summarizes economic literature on local content requirements and detemines general preconditions for establishing an efficient LCR.
- examines BC's wind energy resources and capabilities as well as a general look at the province's energy sector.
- explores case studies of LCRs used in countries and provinces to stimulate wind energy industries.
- reviews the legality of LCRs with regard to World Trade Organization commitments and discusses the dynamics that may affect the legality of such policies.

This paper will then apply these analyses to the BC wind energy landscape, and issue recommendations for the BC government regarding the viability of local content policies for wind energy in the province.

2.0 DEVELOPMENT OF DOMESTIC MANUFACTURING IN THE LOCAL WIND INDUSTRY

2.1 Different models

There are some distinct models for local wind industry manufacturing as depicted in Table 1, which range from the manufacturing of complete wind turbine systems to merely serving as an assembly base for wind turbine components imported from abroad.[4]

Table 1: Models for the Localization of Wind Turbine Manufacturing

	Imported	Localized
Turbine Assembly	foreign turbine component	know-how associated with turbine assembly
Component Manufacturing	not all components manufactured locally	select components (e.g. towers, blades, generator, gearbox)
Full Turbine Manufacturing	nothing, except perhaps a few select components	virtually the complete wind turbine system

Source: Lewis ad Wiser (20005), Table 1, p. 3.

These different forms of localization indicate varying degrees of domestic manufacturing and technology ownership, wherein progression from one model to another over time is possible as technological capabilities are developed.[5]

2.2 Potential Benefits

In large wind farms, wind turbines are estimated to represent up to 70 percent of the total capital investment, which means that most of the initial economic benefits will be tied to the manufacturing activities.[6] These include: economic development opportunities, export opportunities for domestically-made wind turbines and higher growth rates in wind capacity additions.[7]

Wind development is often recognized to create more jobs per dollar invested and per kilowatt-hour generated when compared to fossil fuel power generation.[8] The European Wind Energy Association estimates that for every MW of large scale wind energy capacity installed, 10 jobs associated with manufacturing activities are created or preserved annually compared to the two jobs per year generated in planning, installation and construction activities.[9] In addition, two permanent jobs in service and maintenance are created for every MW of installed wind generation capacity.[10] However, employment creation numbers are often hard to predict and tend to vary depending on the source.

Entering the expanding global market for wind energy by eventually exporting wind turbines is a common goal many countries and sub-national governments aspire to. For example, Vestas of Denmark, the largest turbine supplier in the world, exported 99% of its turbines in 2004. It is crucial that governments are clear about the goals of creating the industry, which models to pursue and the period of time needed to achieve these. The design of the policy incentives used to achieve the specific goals will vary depending on these factors.[11]

3.0 LOCAL CONTENT REQUIREMENTS

Mandating the use of locally manufactured technology in domestic wind turbine projects is the most direct way to promote the development of a local wind manufacturing industry.[12] In general, local content policies force firms interested in selling to a particular domestic market to find ways to set up a manufacturing base locally or to outsource components used in their systems to domestic companies.

The limited amount of empirical evidence available on local content policies indicates that their economic impact tends to go in two extremes. On one hand, failures are linked to less than ideal economic size and restrictions that shield local firms from competition. On the other hand, successes are associated with reasonable content policies, which encourage beneficial economies of scale and clear contexts of the competitive situation.[13]

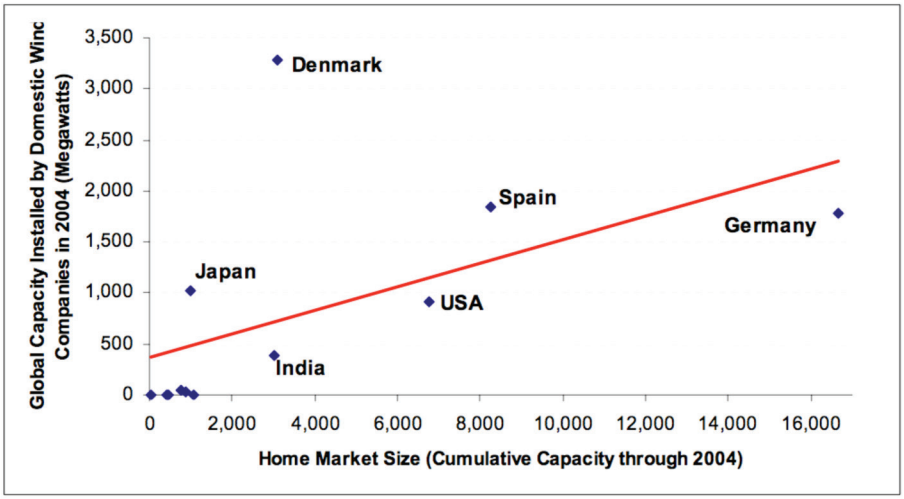
Failure to achieve economies of scale is one of the most prominent reasons against LCRs.[14] There is also evidence of lags in the introduction of new technology and in the utilization of more advanced management systems, which further add to the adverse impact of imposing domestic content requirements.[15]

International trade allows a country to specialize in the production and export of products while importing products that can be produced more efficiently in other countries.[16] Conversely, LCRs tend to increase the price of products to domestic consumers, as firms are prevented from buying components from less expensive foreign manufacturers, therefore incurring higher sourcing costs.[17] Moreover, they encourage businesses to locate and manufacture in places that may not necessarily be economically efficient, thereby giving up benefits from other locations or centralization, which also tend to raise prices.

3.1 The Importance of the Home Market and a Sizable, Stable Demand

A stable and sizeable domestic market for wind power utilization appears to be one of the most important factors in affecting the creation of a strong domestic wind turbine manufacturing base as observed in most of the world's leading wind turbine manufacturers (illustrated in Figure 1).

Figure 1. Home Market Size and Global Capacity Installed by Domestic Companies



Source: Lewis and Wiser (20005), Table 1, p. 8.

Home market stability and size is especially important in the early years of a wind company's development when it is likely to make up the majority of its market share. It also serves as a necessary outlet for local manufacturers to test and make adjustments to their manufacturing strategies and technology designs.

A sizable, stable annual demand for wind turbines is another crucial aspect. One study estimates the minimum steady demand needed in developing an emergent local wind technology industry to be at 150-200 MWh/year for three or more years.[18] However, as a wind power company matures and achieves greater technical sophistication, its base country tends to become less relevant since it tends to export a larger share of its wind turbines once the domestic market becomes saturated.[19]

Manufacturing facilities in unstable or small markets will likely be less efficient because of an inability to reach the economies of scale necessary for cost effective production. Firms in such markets will be less willing to spend money on local manufacturing facilities and other supporting activities. A stable and sizable home market may also be a prerequisite to induce leading foreign manufacturers to establish local manufacturing bases or to develop local joint venture partnerships.

3.2 The Importance of Policy Measures and Policy Environment

National and sub-national governments can use both direct and indirect policy measures to encourage wind manufacturing localization.

Local content requirements fall under the direct category and can be classified as TRIMs ("Trade Related Investment Measures"). Almost all TRIMs are investment disincentives because they push firms to undertake commitments on performance requirements they might not otherwise carry out. In isolation, they make a particular location less attractive and can only be effectively used in conjunction with other incentives.[20]

Without the existence of some offsetting incentive to counter the burden set forth by the local content requirement, firms would have absolutely no incentive to comply with the content policy.[21] Therefore, the importance of indirect policy measures that support wind power utilization in general becomes critical to achieve a sizable, stable local market.

A recent study shows that the stability of the policy environment is cited by renewable energy investment firms, particularly wind energy firms, as one of the most important criterion for assessing the attractiveness of a jurisdiction.[22] In lieu of this, policy coherence[23] becomes very important.[24]

The stability and coherence of the policy environment relates to the issue of risk for firms, especially in such a rules-based investment and trading environment. Good policy and excellent implementation can reduce disputes and risks associated with doing business or investing in a particular location.[25] Therefore, it is crucial to have cooperation on multiple levels of government in order to design and implement coherent policies, which should also be reflected in the legal framework.[26]

4.0 BRITISH COLUMBIA'S ELECTRICITY INFRASTRUCTURE

The BC Hydro and Power Authority ("BC Hydro") is a British Columbia crown corporation and the largest supplier of electricity in the province, serving over 1.6 million customers, or 94% of the population.[27] It operates under a mandate to "provide reliable power, at low cost, for generations."[28] BC Hydro has a generating capacity of close to 11.5 GW,[29] 90% of which is hydroelectric.[30] This hydroelectric capacity is supplemented by two combustion turbine generating stations located in Prince Rupert and Fort Nelson, and the Burrard Generating Station.[31]

While BC Hydro produces the lion's share of electricity for the province, there are several other power providers. The most notable is FortisBC, a regulated public utility serving approximately 160,000 customers through its four hydroelectric generating plants with a combined capacity of 223 MWh and an annual energy output of approximately 1,600 GWh.[32]

BC's network of transmission and distribution lines are a part of the Western Interconnect, which is an interconnected power grid spanning British Columbia, Alberta, 12 western states as well as a section of Mexico.[33] This cross-border transmission grid allows for the import and export of electricity to and from any of the locations that are connected.

BC also has an increasing number of independent power projects ("IPPs") operating, or in the pipeline. As of July 8, 2010, BC Hydro has established 89 electricity purchase agreements (EPAs) with IPPs in the province (63 of which are operational at this time).[34] These EPAs represent a total of 14,244 GWh/year of energy being purchased by BC Hydro.

4.1 Current Wind Power Projects

There is currently one utility-scale wind farm operating in British Columbia. The 102 MW Bear Mountain Wind Park went online in 2009 under a 25 year EPA with BC Hydro.[35] Similarly, BC Hydro has extended a 25 year EPA to the 144 MW Dokie Wind Project which is set to commence energy production March 1, 2011.[36] In addition, BC Hydro selected six wind proposals under the recent Clean Power Call: Knob Hill Energy (99 MW), Quality Wind (144 MW), Meikle Wind Energy (117 MW), Tumbler Ridge Wind Energy (45 MW), Wildmare Wind Energy (71 MW), and Bullmoose Wind Energy (60 MW). All have been granted EPAs.[37] The Clean Power Call has also selected 21 additional renewable energy project proposals which are in line to receive EPAs.[38]

4.2 Canadian Entitlement

An additional source of BC`s power comes in the form of "Canadian Entitlement." The Columbia River Treaty between the United States and Canada saw the building of three dams in BC and one in Montana, primarily to control flooding in the United States.[39] From this treaty, BC is entitled to one-half of the power produced as a result of these dams.[40] This entitlement to downstream benefits is administered by BC Hydro and typically represents about 1.25 GW of capacity, which is assigned to BC Hydro's subsidiary Powerex to market.[41]

4.3 Power Usage in British Columbia

In the 2010 fiscal year, ending March 31 ("FY2010"), BC Hydro's total domestic sales were 50,233 GWh, down from 52,512 GWh in 2009.[42] This figure is the net of electricity sales to residential, light industrial & commercial, large industrial and other energy sales. In FY2010, BC Hydro also sold 48,842 GWh of energy in trade (outside of the province through the Western Interconnect), down from 50,799 GWh in 2009.[43]

5.0 ENERGY EXPORT TO THE UNITED STATES

One of the Obama administration's prime initiatives – the development of sources of alternative energy in order to reduce US reliance on foreign oil, create American jobs, and combat climate change[44] – has led to the development of some of the world's largest wind farms such as the 800 MW Mescalero Ridge Wind Facility in New Mexico and the 909 MW Shepherds Flat Wind Facility in Oregon, which already has a power sales agreement in place.[45] Projects of this magnitude being constructed within the reach of the Western Interconnect, coupled with the US federal government's emphasis on local production, suggest that a decline in US import of Canadian energy should be expected.

6.0 LEGISLATIVE REGIME

6.1 Clean Energy Act

On June 3rd, 2010, Bill 17 – the Clean Energy Act – came into force in the BC Legislature.[46] The Act outlines three areas of priority for the province: ensuring electricity self-sufficiency at low rates, harnessing BC's clean power potential to create jobs in every region, and strengthening environmental stewardship and reducing greenhouse gases.[47] One of the key elements of ensuring electricity self-sufficiency at low rates is to attract new investment in clean, renewable power and energy security. In an effort to achieve this, the Act requires BC Hydro to acquire an additional 3,000 GWh of clean electricity by 2020.[48] This legislative direction is in step with BC Hydro's recent efforts, specifically, its Clean Power Call.

6.2 Clean Power Call

"To ensure that there is sufficient clean, renewable energy to meet forecast electricity demand, BC Hydro issued the Clean Power Call on June 11, 2008."[49] The response to the Clean Power Call comprised 68 proposals totalling over 17,000 GWh/year of energy.[50] BC Hydro ultimately awarded EPAs to 27 clean power projects, which will add 3,266 GWh/year of firm energy and 1.168 GW of capacity in the form of 19 run-of-river projects, six wind projects, one storage hydro project and one waste heat project.[51] The Authority had initially planned to accept up to 5,000 GWh/year; however, the unsuccessful proposals were deemed to be cost prohibitive, or have other eligibility or risk-related issues.[52]

6.3 Federal EcoENERGY Program

The Canadian Federal Government established a $1.48 billion fund intended to encourage investment in renewable energy in Canada by offering an additional $0.01/kWh incentive for up to 10 years of production.[53] This subsidy was made available for qualifying projects built between April 1, 2007 and March 31, 2011,[54] and to date, six wind projects in BC have registered to take advantage of this funding: Bear Mountain Wind Park, Mount Hays Wind Farm, Knob Hill Wind Farm, Naikun Wind Energy Project Phase I, Naikun Wind Energy Project Phase II and Dokie Wind Project.[55] This subsidy program, however, has not been expanded and the available funding is expected to run out before the end of 2010.[56]

7.0 CASE STUDIES

The following case studies analyze the implementation and impact of LCRs in the Québec, Ontario and Spain wind industries. As the majority of these policies in the wind industry are relatively new, it is important to continue to monitor their effects over time.

7.1 Québec

The province of Québec has created clearly stated objectives in its "Energy Strategy 2006-2015" including goals for the development of wind power. Most significantly, the province plans to have all its currently identified wind potential harnessed by 2015 in order to reach its goal that 10% of total installed energy capacity be supplied by wind by that same year. The objective is also to increase the installed capacity for wind generation from 100 MW to 4 GW.[57] In its Electricity Supply Contracts, Hydro-Québec has thoroughly laid out its policies explaining all regional and provincial requirements as well as detailing consequences of not fulfilling these contracts. Additionally, it has remained consistent in its policies over time, offering stability to investors and reducing risk for the industry.[58]

In the last decade, Québec has released three calls for tenders for the creation of wind farms. The first, released in 2003 for 990 MW, required wind farms be located in the Gaspésie region of the province with regional content requirements that ranged between 40 and 60%. Additionally, it was mandated that the turbine nacelles be assembled regionally. Cartier Wind Energy (739.5 MW) and Northland Power/Northland Power Income Fund (250.5 MW) developed a total of eight farms with turbines supplied by GE Energy.[59] LCRs changed slightly for the second tender, released in 2005. This tender doubled in size with 2 GW of installed capacity and resulted in contracts for 15 farms provided by eight companies. REpower Systems AG and Enercon Canada Inc. were chosen as suppliers for the turbines, agreeing to a minimum 30% Gaspésie regional content for the turbines as well as a minimum 60% provincial content requirement.[60] The latter includes the project's development costs, the costs of construction, the costs of the wind turbines and the costs of raw materials imported into Québec but assembled in the province.[61] Finally, the most recent tender for 500MW of wind capacity offers a maximum total of 250MW for First Nations groups to develop and an additional 250MW for community projects. The local content requirements for this most recent tender remain the same as for the second tender.

There has been a positive response to these tenders demonstrated by the 66 bids submitted for the second tender, with 15 filling the required demand.[62] The most recent tender, which is still in progress, has resulted in 44 proposals submitted by 16 First Nations and community groups, doubling the amount requested by Hydro-Québec to just over 1 GW.[63]

Reactions to LCRs from the industry appear to be mixed. Although some companies have come to accept local content requirements as the norm and would be surprised not to see them, others question the legality of the policy. What the industry did seem to agree on was that LCRs were not enough to turn a prospective company away; if profitability could be achieved, companies would be willing to consider investing.[64]

As a result of the first and second tenders released by Hydro-Québec, a number of manufacturing and assembly plants have been built by GE, Enercon and Repower. Permanent job creation in the Gaspésie region includes approximately 900 direct jobs in manufacturing and 150 jobs in wind farm operation and maintenance. In addition, 150-300 jobs are to be created for each year of wind farm construction and 300 more for the integration of

the Hydro-Québec transmission system.[65] It should be noted, however, that it can be very difficult to use predictions of job creation as a reliable measure of success as different sources often provide significantly different data.

With supportive government laws, fair and transparent policies and clear, consistent local content requirements, Québec's wind energy model is one from which British Columbia can learn.

Table 2: Comparing Wind Energy Environments in BC and Québec

	British Columbia	Québec
Reliance on Hydro Power	90%[66]	96%[67]
Currently Installed and Contracted Capacity	818MV[68]	3GW[69] (3rd tender will provide an additional 500MV)
Regulation of Energy	Regulated	Regulated
Net Exporter of Energy	Yes	Yes

Indeed, these similarities combined with the current success of Québec's wind energy sector make the province an ideal model for the British Columbian government to investigate further.

7.2 Ontario

In May 2009, Ontario passed the Green Energy and Green Economy Act with the goals of encouraging renewable energy development and creating local jobs. The Act is also designed to encourage Ontarians to profit from the generation of their own renewable energy.[70] It is predicted that the incentives provided by this Act will stimulate enough development to exceed the previously established goal from the Ontario Power Authority of 4.6 GW of wind energy by the year 2020.[71] However, without any specific target for wind energy development set by the provincial government, some developers and manufacturers are hesitant to invest in the province. By making a target into law, as has been done in Québec, the industry would be less apprehensive about the possibility of a new government coming into power and shifting priorities.[72]

Ontario's LCRs require that wind power projects larger than 10 kW ensure that a minimum amount of project costs are incurred within the province. For wind projects that reach commercial operation between 2009 and 2011, there is a 25% minimum local content requirement, calculated on the basis of the financial cost of the project. For projects operating after that point, the requirement increases to 50%.[73] The province also includes set percentages for specific activities involved in the development of wind power projects in Ontario.[74] One of the major disadvantages to developers and manufacturers under the province's policy is the consequence of content requirements not being met. The Ontario Power Authority's Feed-In Tariff (FIT) Contract stipulates that if the supplier defaults on the agreement, the contract will be terminated,[75] which can make these kinds of investments very risky from a financing perspective.

Many other jurisdictions with LCRs (including Québec) allow export credits for the percentage of the local content requirement that cannot be met. This allows suppliers to sell wind turbine components outside of the province and count them towards their local content requirements so long as they are manufactured in the province.[76] This ability to use export credits is an effective way for the province to obtain the benefits of job creation within the province, while helping manufacturing companies establish a profitable business model. Ontario appears to be the only jurisdiction that does not allow for this balancing measure, which has caused multi-national corporations like GE, Vestas and Enercon to lobby the provincial government to make changes.[77]

The province has also experienced some negative publicity from their deal with Samsung, which is set to begin in 2012. This contract is one of the world's largest renewable energy deals, creating 2 GW of wind capacity and a provincial manufacturing supply chain.[78] Controversy surrounding the agreement comes from the lack of transparency (no open bidding occurred), and the potential negative impact of a $437 million subsidy over and above the regular FIT on domestic renewable energy producers.[79]

Despite questionable policy decisions surrounding LCRs, there has been significant interest in the province's FIT program to supply renewable energy to the grid. The FIT program offers twenty-year contracts that guarantee rates of 13.5 cents/kWh for onshore projects and 19.0 cents/kWh for offshore which should provide a 10% return on investment.[80] There are also specific incentives for community and First Nations projects that earn an additional $0.01/kWh and $0.015/kWh respectively.[81] Project applications summing to 8 GW of wind energy have been submitted, with 2.5 GW able to connect immediately while the others need to await further transmission upgrades.[82] The provincial government has been overwhelmed by the positive response, with over 16,000 applications for renewable energy projects being received.[83]

This response however, must also take into account the financial cost of implementing a FIT program. For instance, the average weighted price of electricity in Ontario as of August 2010 was 4.02 cents/kWh.[84] With the FIT program guaranteeing rates between 13.5 and 19.0 cents/kWh, a significant discrepancy exists. Typical consumers in Ottawa are now paying 17.7% more for their energy than they were in April of 2010; half of the increase is due to the implementation of HST, but the other half resulted directly from rate increases. Additionally, rates are predicted to increase steadily for the next four or five years.[85]

In terms of job creation, the Ontario government has predicted that 50,000 new jobs would be created as a result of the Green Energy and Green Economy Act within its first three years (2009-2012).[86] This can be compared with a study conducted by the Political Economy Research Institute (PERI) at the University of Massachusetts-Amherst, which found that the Green Energy and Green Economy Act could be responsible for the creation of 90,000 jobs each year for ten years following its inception.[87] Once again, job creation numbers can be difficult to predict and often differ, so these numbers should be weighed accordingly. Research has demonstrated that as of April 2010, the province had attracted $9 billion in investment, 20,000 direct and indirect jobs and 2.5 GW of new renewable energy.[88]

Ontario's wind energy economy is growing quickly but one must also take into account the significant cost that consumers often bear with a program like this. Although it is impossible to say exactly what the costs of implementing LCRs in BC may be, it is fair to assume that Ontario's Green Energy Act offers substantive insights.

7.3 Spain

Looking outside Canada, Spain is one of the clear leaders in the wind energy industry, with wind energy making up 9% of its total energy production by 2007.[89] Ranking third behind Germany and the United States in total installed wind capacity,[90] Spain set an initial target in 1999 of 9 GW of installed wind power by 2011. Having surpassed that goal by 2005, the Spanish government more than doubled the target to 20 GW by 2011.[91] By 2008, Spain reached 16.5 GW of installed wind capacity and was on target to reach 20.2 GW by 2010.[92] In addition to focused targets, Spain implemented a number of direct and indirect policies to help support local development. Most notably, the government introduced an aggressive national FIT policy while some individual regions in the country introduced local content requirements.

Provinces that have used LCRs as a method of increasing economic growth include Galicia, Navarra, Castile and Leon, and Valencia. Specifically they have focused on local manufacturing of turbines and components as well as local assembly before granting eligibility for development concessions.[93] Both Galicia and Navarra require a minimum of 70% local content, which has resulted in an estimated 4,000 local jobs for the Navarra region.[94]

With the massive success of Spanish-born companies like Iberdrola, which built its first wind farm in 2000 and was the largest owner of wind farms in the world by 2005, Acconia Energia, which in 2005 was the largest constructor and developer of wind farms globally, and Gamesa Eólica which is the second largest manufacturer of turbines in the world, it is difficult to dispute the success of Spain's policies in developing its wind industry.[95]

However the total cost of Spain's renewable energy program, that its government is ultimately liable for, has created a debt of approximately €16 billion.[96] The country is re-evaluating this generous subsidy program, and is planning on a 35% decrease in wind energy subsidies by January 1st, 2013.[97] This reduction is meant to decrease the €4 billion gap between what consumers pay for power and wholesaler's prices. This should save consumers $1.5 billion USD over the next three years but has caused investors to lose confidence in the country's public sector credit.[98] The uncertainty has also forced some companies to delay their IPOs and others to look at investing in less risky markets.[99]

Although Spain has seen enormous success in the wind industry for the past two decades, this success has come at a significant cost. It is also important to note that the country's status as a relatively "early mover" puts it in a very different position than BC.

These case studies show that LCRs can be a successful addition to an energy policy for encouraging domestic economic development, so long as they are supported by other incentives. It is crucial to note, however, that local content requirements are industrial policies that focus on job creation, and without appropriate incentives, they make investing in wind energy less appealing. These incentives can also come with a significant cost to both the consumer and taxpayer, which must be taken into consideration.

8.0 INTERNATIONAL TRADE LAWS

While the above case studies demonstrate that countries and provinces have enacted LCRs, questions remain as to the legality of such measures with regard to World Trade Organization ("WTO") rules.

9.0 RELEVANT WTO SECTIONS

The WTO, which comprises 153 member states, oversees international trade.[100] All members must agree to abide by the General Agreement on Trade and Tariffs (GATT), which is an agreement primarily concerned with lowering international trade barriers.[101]

There are two articles in GATT that may ban the use of LCRs. Article III of GATT, entitled "National Treatment on Internal Taxation and Regulation" states that countries should not use laws or taxes to protect domestic production or to discriminate against imported products.[102] Specifically, paragraph 4 affirms that all imports "shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements."[103] In addition, Article XI, which deals with quantitative restrictions, disallows states from using methods other than duties or taxation to restrict importation. States may not attempt to limit imports through "quotas, import or export licenses or other measures."[104] The aforementioned Articles are reinforced by Article I, which precludes the discrimination of a product based upon country of origin.

All WTO members must also follow the legally binding Agreement on Trade-Related Investment Measures ("TRIMS Agreement") which "essentially interprets and clarifies the provisions of Article III (and also Article XI)."[105] The Annex of the TRIMS Agreement provides an illustrative list that provides further detail of measures banned under Articles III and XI. Countries violate the TRIMS Agreement by requiring "the purchase or use by an enterprise of products of domestic origin or from any domestic source, whether specified in terms of […] a proportion of volume or value of its local production."[106]

Nevertheless, there is a provision that provides an exemption to Article III rules, found in paragraph 8 of Article III. Article III: 8(a) exempts countries from following Article III so long as the government action relates to "the procurement by governmental agencies of products purchased for governmental purposes and not with a view to commercial resale or with a view to use in the production of goods for commercial sale."[107] In 1996, Canada voluntarily entered into the Agreement on Government Procurement ("GPA"), thereby waiving its Article III:8(a) rights at the federal level.[108] However, Canada stated that the provinces and their ministries would not be bound by the GPA, unless otherwise negotiated and agreed upon.[109] In the 14 years since the GPA came into force, Canada has made only one bilateral agreement that binds the provinces with the US, and it focuses on iron, steel and manufactured goods.[110]

Because Canada has exempted provinces from the GPA, it is likely that Article III: 8(a) could potentially immunize provincial actions. It is important to note that the WTO does not have a police body and will not unilaterally rule against any particular domestic law. It is the responsibility of another country to file a formal complaint. Since a country will be most likely to file a complaint when it receives pressures from its companies or unions, complaints are most likely to be lodged "when such local content requirements limit a company's ability to do business."[111] Consequently, the lack of WTO verdicts against the existing LCRs for wind energy should not be construed as internationally-sanctioned legislation.

10.0 INDIAN AUTOMOTIVE CASE

A case study of the Indian Automotive Industry demonstrates how the WTO Dispute Settlement process has operated in relation to LCRs, even though WTO panel rulings are not bound by the legal principle of stare decisis, meaning that panels are not formally bound to follow previous rulings.

In October 1998, the European Communities ("EC") filed a Request for Consultations with India, the initial step in filing a complaint, alleging that Indian government policy mandated local content requirements as well as export balancing requirements in the automotive industry.[112] The EC, and later the US, alleged that India violated Articles III and XI of GATT and the TRIMS Agreement.[113] This move followed India passing a law in December 1997 that required car manufacturers relying on imports to sign a Memorandum of Understanding that obligated them to fulfill an "indigenization requirement."[114] A WTO panel was convened in July of 2000 and issued a ruling in December of 2001 that found that India's indigenization requirement had violated Article III of GATT.[115] India initially appealed the ruling but later dropped their appeal and by November 2002, India had fully complied with the ruling.[116]

This formal process took more than four years to reach a settlement and be implemented. And while this case did result in India repealing the local content requirement, the WTO appellate panel never ruled on India's appeals.

11.0 CURRENT LOCAL CONTENT REQUIREMENTS

While the analysis of relevant laws strongly suggests that LCRs are prohibited by the WTO, the fact remains that some countries have utilized such requirements for many years.

11.1 China

China's local content policies related to wind energy can be traced back to at least 1996.[117] As of 2004, China used a local content policy requiring 70% domestic content and also used local content as a key criterion in awarding wind farm development projects.[118] In October of 2009, China announced an end to its LCRs for domestic content.[119]

11.2 Brazil

Brazil's clean energy legislation, known as the Profina program, also employs an LCR for wind energy. Although the LCR has been in place since 2005, evidence suggests a lack of manufacturing capacity in the country results in the requirement being of marginal value.[120] While Brazil has lowered its LCR threshold somewhat due to lobbying from its wind energy industry, local funding is still dependent upon an LCR.[121]

11.3 Spain

Several of Spain's provinces have independently employed local content policies, with compliant companies being given market access in exchange for meeting the content requirements.[122] Gamesa, now a global wind turbine manufacturing giant, entered the wind energy sector in 1994 when it took advantage of LCRs to receive government subsidies.[123] At the time of this writing, there are no challenges in the WTO against Spain's policies.

11.4 Ontario

On September 13, 2010, Japan filed a Request for Consultations with Canada in regards to Ontario's Green Energy and Green Economy Act, 2009, due to its LCR.[124] Japan argued that Ontario's Act discriminates against foreign products and acts as a banned subsidy and that consequently, the Act violates Article III, TRIMS as well as the agreement on Subsidies and Countervailing Measures ("SCM").[125] The SCM is relevant here because under the Ontario Green Energy Act, companies receive the Feed-In Tariff rate only if they fulfill the LCR; thus, it constitutes a banned subsidy.[126] In another ominous sign, on September 30, 2010, the US and the EU announced they filed notices with the WTO that they would like to join

Japan in their consultations with Canada.[127] It is too early to know what the impact of this challenge will be, as the WTO process relies heavily upon negotiations between the disputing countries and the result can often be trade-offs through a private settlement, rather than a clear, definite resolution.

11.5 Québec

Québec's LCRs, which are a few years older than Ontario's policies, date back to 2003.[128] Québec's regulations stipulate that 60% of the turbine's costs must be incurred in Québec, with a certain percentage to be met in a particular region of the province.[129] While it may seem odd that the newer Ontario laws were challenged without mention to or protest of Québec's laws, a potential explanation is given below.

12.0 PRACTICE VERSUS PROTOCOL

12.1 Industry Size

The most logical explanation put forth for the previous lack of challenges to local content policies in wind energy industry is its lack of size.[130] Wind energy, while growing, is still quite small when compared to sectors like agriculture and developed areas of manufacturing, which are both more prone to disputes. Clean technology's forecasted growth should only serve to increase the contentious nature of protectionist policies.

12.2 Japan's Challenge to Ontario

On the face of Article III and TRIMS, Ontario's Green Energy and Green Economy Act is in violation of WTO rules, yet it is possible that Canada could use Article III: 8(a) to save its policy. This suggestion, that Ontario's actions fall within the category of government procurement and are thus exempt from Article III considerations, has been advanced as a potentially viable defense for Canada.[131]

A review of the WTO Analytical Index, which records how WTO panels have interpreted treaty articles, reveals that no cases have interpreted Article III: 8(a); however, Article III: 8(b), which allows governments to provide subsidies "exclusively to domestic producers" has been advanced in some arguments to WTO panels.[132] Cases involving Article III: 8(b) have tended to read that exemption very narrowly, likely because a broad reading would weaken Article III as a whole. In Indonesia – Autos, the court found that "subsidies to producers are subject to the national treatment provisions of Article III when they discriminate between imported and domestic products".[133] Article III: 8(a) could very well be interpreted in a different manner. Ultimately, the lack of jurisprudence makes it very difficult to be certain as to whether the Ontario measures would be protected by the government procurement exemption, or instead would be considered commercial sale and thus in violation of Article III.

It has been posited that Japan is challenging this law because they feel that the Korean company Samsung received a highly favourable contract from the Ontario government.[134] While this may help to explain the motives of the Japanese government and why the government has not challenged the Québec policies, such explanations would not impact the legitimacy of the Japanese claim.

While the outcome of Japan's challenge may or may not directly affect Québec's policies, a ruling against Ontario would certainly create an air of uncertainty regarding current or

proposed LCRs. Thus, even if a country or a province were bold enough to enact a new local content policy, businesses would likely be wary to commit to a long-term business operation based on a policy in which it had little confidence.

Another factor that may complicate matters is Canada's negotiations to open its government procurement practices at the provincial level to the European Union.[135] As mentioned, Canada decreased some provincial barriers toward US firms. Ultimately, even if the WTO rules in favour of Ontario, treaties made at the federal level could inhibit provinces' ability to enact local content measures with impunity.

12.3 Kicking Away the Ladder

This theory suggests that states use protectionist policies to build up domestic capacity. Once they reach the summit, they 'kick away the ladder' for other states to use, so that they may exploit foreign, undeveloped markets. This theory could be relevant to the recent Chinese decision to loosen LCRs. China's government-directed growth has created large, efficient manufacturers poised to exploit export markets.[136] China may not be far off from entering the export market for wind turbines, reducing their own protectionist policies and then pressuring other governments to follow suit.

While several countries and provinces have benefitted greatly from LCRs for wind energy, it seems that the time to exploit these policies may be coming to an end. The growth of the wind energy sector will only make it more likely that these protectionist laws will be challenged. As countries and their companies develop sufficient capacity, they will seek to export to other countries and will certainly challenge barriers that inhibit their ability to do so.

As Japan is currently challenging Ontario's law, it would be imprudent to recommend adopting such a policy at this time. This paper will not speculate as to how a WTO panel would rule; consequently, a wait-and-see approach is recommended.

13.0 APPLICATION TO BC

A major concern with local content requirements is the impact on export opportunities as more jurisdictions begin to implement these policies. In the context of wind turbine manufacturing, there is an exhaustible domestic market, which means that export opportunities are an important consideration for potential investment. Local content requirements heavily favour early movers, and at this point in time British Columbia is well behind several other large markets, and is thus severely limited in their export opportunities.

Moreover, as markets become smaller, the incremental costs of imposing local content requirements also tend to increase. BC's relatively smaller market size should be kept in mind when comparing it to other jurisdictions (e.g. China, Spain, etc.) that appear to have been successful in imposing LCR policies in their domestic wind industries.

As previously discussed, the importance of a sizable, stable annual demand for wind turbines is a key condition for the successful development of a local wind energy industry. Specifically, the minimum steady demand must be at least in the 150-200 MWh/year range for three or more years.[137] BC Hydro's 2008 Clean Power Call was prepared to accept up to 5,000 GWh/year of electricity; however, to date, BC Hydro has only offered 3,266 GWh/year worth of EPAs.[138] It can be assumed that the remaining 1,734 GWh/year difference is demand that BC Hydro believes exists; it amounts to far more than the requisite 150-200 MWh/year. BC Hydro's total purchase

goal, combined with the fact that that the province has an estimated 9 GW of 'readily available' wind power capacity considered readily-available, suggests that the steady demand requirement for industry development is satisfied.[139]

Many cleantech projects entail substantial capital requirements. Although policy measures geared towards the encouragement of clean energy investments, such as the Clean Energy Act, have recently been enacted in BC, these policies do not directly support the wind industry. For companies to enter jurisdictions with LCRs there should be incentives that provide assurances that their investments will be profitable. Ultimately, the issue for firms is return on investment: determining if the benefits outweigh the costs.[140]

Guaranteed energy purchases through Feed-In Tariffs or tenders for specific energy amounts are two examples of indirect policy measures currently being used in Canada that mitigate these firms' investment risks.[141] Interviews with corporate officials suggest that guaranteed energy purchases were significant factors in deciding to locate operations in Quebec.[142] Interviewees also stressed the importance of entrenching laws with clear targets, as opposed to simply announcing goals.[143] Therefore, providing specific targets for each kind of renewable energy would also help mitigate the risks involved with investing in a particular jurisdiction.

In addition, concern was also raised about the stability of supportive policies depending on the governing party, which might be reversed with a change of government.[144] To illustrate, the fluctuating nature of the federal wind energy Production Tax Credit (PTC) has been one of the biggest hindrances to even greater wind installation in the US.[145] Having been introduced as part of the Energy Policy Act of 1992, a succession of short-term renewals and the expiration of the PTC has led to three "boom and bust" patterns in wind power installation.[146]

In conclusion, BC has sufficient demand, as well as supply, to accommodate wind energy projects; however, BC's current policy climate is poorly suited to attract wind energy companies. Firms feel confident in investing in a jurisdiction when a government entrenches laws, sets clear targets and offers meaningful incentives.

14.0 RECOMMENDATIONS

While the imposition of local content requirements has created strong domestic wind energy industries in some areas, this paper cannot recommend that BC follow this route. The legal uncertainty created by the recent Japanese challenge now reduces the ability of the Province to enact a local content policy capable of encouraging long-term business investment. This challenge has very recently been given further support by the US and the EU. Moreover, the WTO's narrow application of a similar defence to the government procurement exemption does not bode well for Ontario's Act. In the event that the WTO rules in favour of the current Ontario law, BC would then have adequate security to implement a LCR. However, other underlying trends, such as the growth of the wind industry and Canada's negotiations with the EU on government procurement practices, could impede the future viability of such a policy. This is particularly pertinent as successful wind energy policies require the type of long-term stability, which the current legal environment cannot support.

While the legal situation is determinative in coming to this conclusion, it is worth summarizing the likely costs and benefits of a local content policy. LCRs, on their own, would act as a hindrance for foreign investment and therefore, would serve to reduce the efficiency of manufacturing wind turbines. Consequently, this paper assumes that the BC government would only implement a local content policy in conjunction with incentives geared toward attracting investment. However,

given the inefficiencies typically associated with LCRs, in particular higher prices that hinder economies of scale, costs to energy consumers would rise. This is especially relevant since BC Hydro operates under a mandate to provide reliable, low cost power to its customers, and that BC is largely reliant on hydro power, which is a cheaper alternative.

It must also be noted that a local content requirement and any attached incentives would benefit or harm different economic actors differently. With its imposition, BC would likely receive an increase in jobs in the wind manufacturing sector and gain tax revenue from these jobs and from manufacturing operations within the province. However, BC, being a smaller jurisdiction than other provinces and countries implementing local content policies, may suffer from a lack of choice of suppliers. This may prevent manufacturers from being able to reach an economy of scale that would be available if the manufacturing was not forced to occur in BC.

In spite of these findings, this paper believes that there is still an active role the government can play in stimulating local economic actors while still attracting investment in BC's wind energy sector. The first step is to create a firm commitment with specific targets for each kind of renewable energy. Creating a hard target for wind energy, as well as hard targets specific to other types of green energy, should be considered a prerequisite. When a government has not demonstrated dedication to green energy, businesses consider an ambiguous policy environment to be a risk to their investment. Many cleantech projects demand a substantial capital investment and require stable policies to achieve commercial success. In addition, indirect policy measures that support the utilization of wind power can create a suitable environment for a local wind manufacturing industry by creating a sizeable domestic market and stable annual demand for wind turbines. The size and stability of demand appear to be among the most important factors in affecting the creation of a strong domestic wind turbine manufacturing base.

In order to develop this type of demand, it is advisable to explore the use of other direct and indirect policy mechanisms such as financial and tax incentives, research and development support, mandatory renewable targets and guaranteed energy purchases. Creating an active stable of such options and making them available to the clean technology industry would benefit not only the environment of British Columbia, but also its long-term economic health.

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