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Author: Stewart Fast, & Robert McLeman

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Attitudes Towards New Renewable Energy Technologies in the Eastern Ontario Highlands

Stewart Fast
University of Ottawa
sfast082@uottawa.ca

Robert McLeman
University of Ottawa
rmcleman@uottawa.ca

Abstract

As governments seek to expand generation capacity from sources such as solar farms, wind turbines, hydroelectric and biomass generators, rural responses to renewable energy become increasingly important. In early 2011 we conducted a mail-out survey of permanent residents, a concurrent internet-based survey of seasonal residents and follow-up focus groups in two rural eastern Ontario municipalities to assess public attitudes and to project acceptance and potential uptake of various technologies. Survey participation was relatively high (n = 180, response rate 22%). One focus group included local and regional government decision-makers, the other for residents representing a range of socio-economic and demographic groups. Results showed strong support among residents to pursue alternative energy sources (89%), mostly out of concerns with rising energy costs, but also from a desire to use local energy sources. Support was highest for solar technologies (87%) and lowest for wind turbines (58%) and new hydroelectric dams (58%). There was little evidence of NIMBY views being prevalent among permanent residents. Seasonal cottage dwellers were less supportive of hydroelectric dams and a wood pellet facility. Our findings suggest rural residents start with favourable attitudes towards alternative forms of energy production. Acceptance and uptake will likely be strengthened by locally relevant demonstration projects and by supporting citizen involvement in task groups, workshops or other venues for information sharing.

Keywords: Renewable energy, attitudes, NIMBY, acceptance, feed-in-tariff

1.0 Introduction

As governments seek to expand capacity to generate electricity and to heat buildings from "green" sources (i.e. non-fossil-fuel, non-nuclear), interest and investment in renewable energy technologies (RETs) have grown. RETs, including photovoltaic installations, wind turbines, hydroelectric generators and biomass combustion facilities, are new forms of land use largely situated in rural areas. RETs are often promoted as a means of environmentally and economically sustainable development for rural communities (Fitzgibbon, 2010; Scheer, 2007). However, some projects – wind farms in particular – have received mixed responses from rural populations in North America and Europe (Devine-Wright, 2005; Devine-Wright, et al., 2009; Hill & Knott, 2010; van der Horst, 2007; Warren, Lumsden, O'Dowd, & Birnie, 2005; Woods, 2003). The key concern from the energy policy perspective is that without taking into account the social responses to RETs it may prove difficult for targets for RETs to be reached. From

a rural studies perspective, there is a parallel interest in avoiding conflict and ensuring that benefits from RETs accrue to the rural communities that are the sites for these new technologies (Fitzgibbon, 2010).

In Ontario, there has been a rapid increase in the number of RET projects approved for development (currently 108 solar farms, 51 wind farms and 47 hydroelectric) and more than 33,000 applications have been submitted for small (less than 10 KW) solar photovoltaic installations (OPA, 2010, 2011). This growth is due to a "Feed-in-Tariff" (FIT) program of the *2009 Green Energy Act* which offers high rates and access to the grid for electricity generated from renewable resources. The roll-out of the *Green Energy Act* has been controversial and a province wide debate has emerged in media and among political parties with concerns raised that RETs are expensive, unreliable, possibly unsafe, that the siting process is undemocratic and the landscape of rural regions is being tarnished (Dewees, 2010; Flaming, 2009; Merriam, 2011; Paperny, 2010; Radwanski, 2011; Wente, 2010). The lively public discussion about the *Green Energy Act* provides a useful opportunity to study in a systematic fashion the formation of public attitudes towards new RETs.

The Eastern Ontario Highlands region has significant potential for solar and wind farms, small-scale hydro and conversion of unutilized biomass to fuel. While its population is one of Ontario's poorest on average, the region is rich in natural resources and a number of government initiatives have been created there to demonstrate and offer incentives for new RET developments. This paper describes early findings from an ongoing investigation into public attitudes, responses and potential uptake of RETs in the region, drawing upon results from a mail-out survey and follow-up focus groups meetings. Through this project we hope to gain insights into potential future energy trajectories in the region and by extension in other similar rural communities. In this paper, we identify those RETs that are most likely to be supported by residents, and the factors that may influence these responses.

2.0 Overview of the Study Region

The term Eastern Ontario Highlands refers to an upland region of mixed forest that encompasses the headwaters of the Skootamatta-Moira, Mississippi, Salmon and Tay river watersheds (Figure 1). The study region is south of Algonquin Park and north of provincial highway 7, and straddles the counties of Lanark, Frontenac and Lennox & Addington. Our study focuses on two municipalities found within this region: Addington Highlands and North Frontenac. The permanent, year-round population of these townships are 2532 and 1842 respectively (Statistics Canada, 2011), but during the summer months the region's population is tripled by an influx of seasonal residents (Cumming Cockburn Ltd, 2003).

This area is characterized by a rugged, heavily glaciated terrain, with extensive lake and river systems. Approximately 70% of the region is forested Crown-owned land, supporting a mix of land-based economic activities, including forestry, outdoor recreation, and subsistence hunting, fishing and trapping (McLeman, 2010). Permanent settlements consist primarily of small village nodes spread along around four main roads. While the average age of residents is over fifty and rising, the population is kept stable by an influx of retirees attracted by the relatively low-priced waterfront properties. Census figures show 30% of the population has moved within the last 5 years (Statistics Canada, 2006) many from nearby urban centres of Toronto and Ottawa. Employment and population trends are consistent with patterns elsewhere in rural eastern Ontario (Sander-Regier, McLeman, Brklachich, &

Woodrow, 2009). Natural resource based activities of forestry and mining employ fewer people and many jobs are now found in servicing tourists and seasonal residents. Seasonal homes outnumber permanent homes and as cottage dwellers have come to contribute a larger portion of the municipal tax base they have, at times, exercised growing political power. For example, in the past 5 years logging plans and a proposal for development of a lakeside lodge have been either modified or dropped amidst concerns expressed by different local cottage associations.

The permanent population experiences employment rates and median incomes (45%; $37,789) that are considerably lower than the provincial average (67%; $69,156), while government contributions (e.g., old age pension, employment insurance) as a proportion of income are higher (29% versus 9.8%) (Statistics Canada, 2006). Household and social activities are tied to the landscape – e.g., chopping firewood and snowmobile club – and, as in other rural Canadian communities, people struggle to retain schools and attract health care providers (McLeman, 2010; McLeman & Gilbert, 2007).

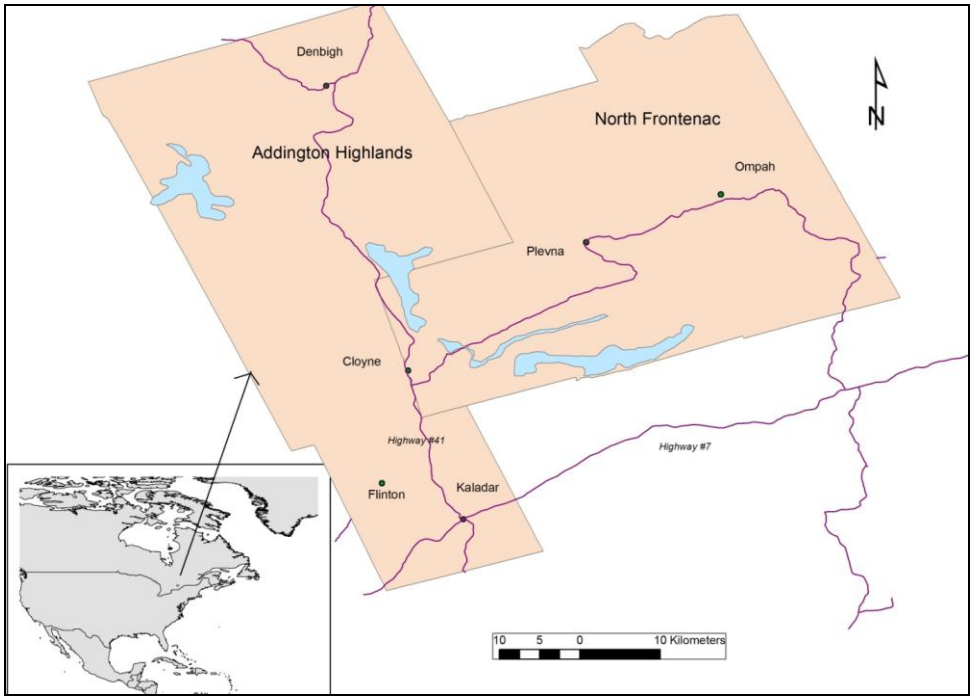

Figure 1. Eastern Ontario Highlands

A number of RET projects have been proposed or initiated in the study area by various government, private sector actors and individuals. The high school has been selected by the school board as a site to pilot test a biomass heating system. Instead of heating oil, wood pellets will be used. Boiler installation and maintenance are paid for by the "Green Schools Pilot Initiative"(Ontario Ministry of Education, n.d.). Several homeowners and businesses have installed solar panels under the FIT/microFIT program mentioned earlier, and one of the municipalities has committed to installing panels on a municipally owned building. Three private wind development companies have expressed interest in developing wind farms along ridges in the northern part of the study area, where test turbines have shown promising conditions. Finally there are dozens of former mill dams and water control structures with the potential to generate hydro-electricity. These latter are overseen by a Conservation Authority who manage water levels for flood control,

drinking water, recreational and wildlife habitat needs. These four examples represent the best-known RET developments in the region. Residents are also aware of developments elsewhere, such as large solar farms to the south and a wind farm on Wolfe Island adjacent to the city of Kingston and south of highway 7.

3.0 Methods

A self-administered questionnaire titled "Household Energy Use and Energy Attitudes in Addington Highlands and North Frontenac Region" was sent by mail in February 2011 to households along selected rural routes and general delivery mail boxes in four sections of the region, two in Addington Highlands and two in North Frontenac. Different coloured paper was used to track geographical origin of responses. The mail out included a cover letter, a form to provide contact information if respondents were interested in follow-up discussions and a stamped self-addressed return envelope. Advance notice of the survey was done by commissioning a local reporter to write an article in the local paper (an unsolicited story also appeared in another lesser-read paper). A fortuitous public reminder was provided when a respondent wrote a letter to the editor commenting on the survey. A separate on-line version of the survey was made available over the period February to August 2011 to solicit responses from seasonal cottage residents and allow any permanent residents whose mail box was not selected to receive the mail-out a chance to respond. Ten different cottage associations provided assistance in contacting seasonal residents through newsletters, web-site postings and attendance of the first author at an Annual General Meeting.

The questionnaire consisted of four main sections: types of fuels used and quantities; level of agreement with different statements about energy issues; level of agreement with hypothetical RET projects, proponents and locations; and, background demographic information. Wording and layout were selected after pre-testing with selected local residents. The data was analyzed using Excel (2007 version) and PASW (version 18).

Two focus groups were subsequently held in March 2011 lasting between 2.5 and 3 hours each. Recruitment for the first group was from individuals who completed the questionnaire. From 20 individuals who indicated potential interest, twelve were invited and eight showed up on the day of the meeting. An effort was made to select a diversity of opinion on renewable energies based on their survey responses, and participants included a mix of newcomers and long-time residents. A one-page backgrounder was sent to participants prior to the meeting to explain the format and advise of general topics for discussion.

Participants in the second focus group were selected for their being active participants in governance structures in the region. The eight participants included three township councillors, and representatives from the two Conservation Authorities and the two Counties with jurisdiction in the region, the provincial Ministry of Natural Resources, the local regional forest management company, and the local regional tourism association. Participants were also sent the one-page backgrounder prior to the meeting.

Meetings were moderated by the first author and held in a village hall. A research assistant took notes and audio-recorded the meetings. Both groups opened with the same question: "How will people in Addington Highlands and North Frontenac meet their energy needs 20 years from now?" which initiated a broad-ranging, lightly moderated discussion of energy options, opportunities and barriers in the

region. After a break, preliminary findings from the survey were presented and discussed. A final exercise entailed a guided discussion of the four examples of local RET projects described in section 2 above, during which participants commented on their views of each, and their opinion of which types of RETs would be most successful in the region in the future.

Our study has several potential limitations that should be kept in mind when reading the following results and discussion sections. First the response rate (22%) to the survey adds a possibility of response bias. Second the survey findings may not be generalizable to other rural settings where forest biomass is less prevalent. Third, the focus group discussion is unique to the group of individuals at the table and would have been different with a different set of participants.

4.0 Results

4.1 Survey

We distributed 836 questionnaires of which 180 (22%) were returned representing 9.4% of the total number of permanent households (1,920) in the townships. Those who completed the survey tended to be close to community characteristics reported in the 2006 census in terms of age, employment status, and income, but had higher levels of formal education. The demographic characteristics of the respondents are shown in Table 1.

Table 1. *Demographic characteristics of permanent residents of Addington Highlands and North Frontenac surveyed on energy use and energy attitudes in February to May 2011*

Characteristic	**Number of responses to question and %**
Gender	n = 172
Male	54%
Female	46%
Education	n = 157
High school completed	71 (45%)
Apprenticeship	9 (6%)
College or university	77 (49%)
Household income	n = 141
Under $20,000	20 (14%)
$20 – $39,000	42 (30%)
$40 – $59,000	31 (22%)
over $60,000	48 (34%)
Occupation (top 4)	n = 160
Retired	83 (52%)
Construction	19 (12%)
Business operator	13 (8%)
Health care	11 (7%)
Village	n = 175
Flinton	60 (34%)
Denbigh	54 (31%)
Ompah	35 (20%)
Cloyne	26 (15%)

Our efforts to obtain responses from seasonal cottage dwellers yielded 23 completed on-line questionnaires. Seasonal respondents had higher levels of formal education (91% with college or university) and higher income levels (84% over $60,000) than the permanent resident population. We consider the responses from seasonal residents as a separate sample and do not include them in our reporting of general trends for the population of the eastern Ontario Highlands region. There are two reasons for this: first, collection methods differed for each population and second, seasonal (i.e., second home) residents make up a distinct, more affluent and highly mobile population whose interests and experience in the region inherently differ from permanent residents in many ways (McLeman, 2010). However, their views are important to future energy developments and seasonal resident survey responses, are compared to those of the permanent resident population in several places in the following discussion.

4.1.1 Household Energy Use Patterns

Use of wood for household heating is widespread in this region, 71% use wood as either primary or secondary heating source, another 12% use wood pellets. This is a unique energy pattern for planners if we consider that the Canadian average for heating with wood is 4% as the primary heating source and 6% as a primary or secondary source, see more in Table 2. Three quarters of residents use 3 or more bush cords annually (a unit of split firewood stacked to be four feet high, four feet deep and eight feet deep - 1.3 m x 1.3 m x 2.6 m) and over half (56%) cut their own wood.

Table 2. *Household heating sources in use in the study area and in Canada*

Heating source	% of residents in study area using (n = 180)	% of all Canadians using as primary heating source (SHEU, 2007)
Wood	71%	4%
Heating oil	40%	8%
Electricity	31%	38%
Wood pellets	12%	Reported with wood
Propane	14%	1%
Natural gas	N/A	44%

In terms of other household energy use, 57% of residents spend more than $200 on gasoline or diesel per month and most residents (60%) spend between $100 and $200 per month on electricity. Only one respondent reported no gasoline or diesel use and only four respondents (2%) were “off-grid’ (obtaining electricity from their own generation and not the provincial electricity distribution system).

4.1.2 Views on Energy

More than 90% of residents agreed that costs and reliability are important energy issues for the future (Figure 2). Support was also high for using local energy sources (83%) but residents were less sure of there being a need to avoid fossil fuels (51% agree). A high proportion of residents (89%) think it is important to look for alternative ways to use and obtain energy. In terms of personal habits 92% indicated they find ways to reduce use of energy to save money while 75% indicated they do so to help the environment.

Responses were solicited on a Likert scale (1 = strongly agree, 5 = strongly disagree), allowing for statistical comparison of mean values and insight into

possible group differences. Views on energy are consistent across permanent residents in the region with a few minor exceptions. Lower income individuals attributed more importance to keeping energy costs low (household income less than \$20,000 $\bar{x}$ = 1.28, \$20,000 – \$39,000 $\bar{x}$ = 1.55, \$40,000 - \$59,000 $\bar{x}$ = 1.62, >\$60,000 $\bar{x}$ = 1.62, ANOVA P=.027) and those with apprenticeship level of education felt less strongly about the need for alternative energy ($\bar{x}$ = 2.44 compared to $\bar{x}$ = 1.49 for high school education and $\bar{x}$ = 1.57 for college education, ANOVA P=.009). No significant differences exist in the views of residents living in different villages, or between male and female respondents or between those who are raising children or not. Seasonal residents felt that looking for alternative ways to produce energy was less important than did permanent residents ($\bar{x}$ = 2.86 vs. 1.58, p<.001, Welch T-test) and expressed less concern with keeping energy costs low ($\bar{x}$ = 2.00 vs. 1.31, p<.001, Student T-test).

Many (28%) of the respondents added comments to help explain their responses. The quotations below illustrate the types of energy-related concerns residents expressed.

> "Something should be done about hydro charges going up constantly."
>
> "Living in an underprivileged area, with declining youth population (under 40 yrs) it is imperative that any green technologies that could produce and maintain economy is [sic] beneficial."
>
> "A lot of people in our area cannot afford the continually rising costs of hydro."
>
> "I would think that most people would like to be off the grid mainly for reliability as there have been numerous outages and most have a generator as back up."

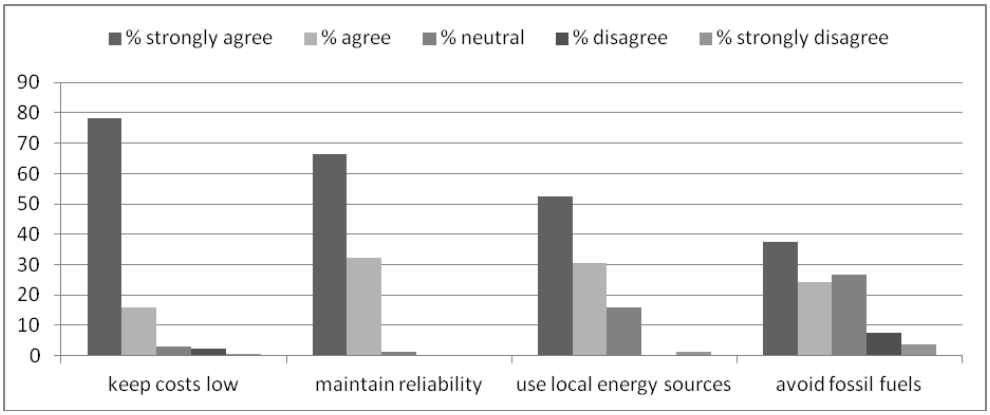

Figure 2. Response to question "What are most important energy issues in the future?" from residents of Eastern Ontario Highlands surveyed February to May, 2011

When asked if they would like to see more renewable energy produced in their township, 88% of respondents were supportive and 97% were supportive or neutral (Figure 3). When a NIMBY element was added to the scenario slightly more opposition emerged and 11% of residents said they would prefer to support RET only if it occurred outside the region. ANOVA and T-tests reveal no statistical difference between the responses of residents with different income or education

levels, those living in different villages or those raising children or not. Seasonal residents are slightly less likely to desire renewable energy production in the region ($\bar{x}$ = 2.09 vs. $\bar{x}$ = 1.56, P<.1, Welch T-test) but no more likely to have NIMBY attitudes than are permanent residents.

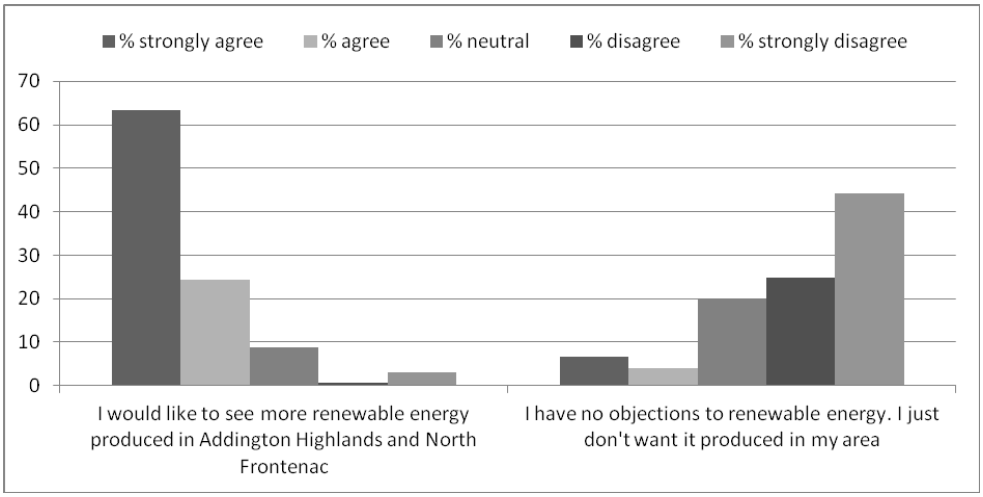

Figure 3. Levels of renewable energy "NIMBY" attitudes among residents of Eastern Ontario Highlands surveyed February to May, 2011

Table 3 reports attitudes towards nine renewable energy options for the region including differences in attitudes associated with various socio-economic factors. Support was strongest for rooftop solar panels, and all of the solar options presented in the survey ranked highly relative to other technologies. Older residents without children expressed less support for rooftop solar panels than did residents with children. The least preferred options are a wind farm or a new hydro dam. Support for a new hydro dam is lowest among permanent residents with no children; seasonal residents also indicate low levels of support, bordering on outright disagreement, to a dam. Support for a new dam is very high among respondents residing in the village of Flinton, where there already exists an aging dam on the Skootamatta River. The option of renovating an existing dam receives greater support among permanent residents, with seasonal residents being less supportive. Support for a wind-farm is mixed, with respondents earning less than $20,000 /yr significantly more likely to approve of such a development. Wind farms and a new dam appear to be the most polarizing options given the relatively high number of people disagreeing or strongly disagreeing with them as compared with other RET options.

New uses of forest resources in the form of a pellet plant or a wood chip boiler receive moderate levels of support. These options had large proportion of respondents who were unsure or neutral of these technologies. This could indicate respondents were ambivalent about these options or that more information was needed before declaring a position. Seasonal residents had statistically lower support for a pellet plant than did permanent residents. Not surprisingly those that heat with pellets were more likely to support a local pellet plant than those heating with oil, electricity, propane or firewood ($p<0.05$, t-test, not reported in Table 3).

Table 3. *Attitudes towards different sources and sizes of RET in the eastern Ontario Highlands*

	Rooftop solar	**Solar farm**	**Scattered panels**	**Renovate dam**	**Pellet plant**	**Wood chip boiler**	**Scattered wind turbines**	**New dam**	**Wind farm**
% support	87	79	73	72	67	63	63	58	58
% opposed	5	11	9	13	14	11	18	21	25
% neutral	8	11	19	15	19	26	19	21	17
	Likert scale (1 = strongly agree, 5 = strongly disagree) mean values								
Standard error of mean (2 SE)	1.46 – 1.76	1.63 – 2.00	1.71 – 2.07	1.78 – 2.19	1.94 – 2.33	1.93- 2.31	2.10- 2.53	2.14- 2.60	2.20-2.66
Gender									
male	1.58	1.94	1.94	**2.17**	2.32	2.28	2.33	2.37	2.44
female	1.63	1.76	1.88	**1.79**	2.04	2.06	2.38	2.32	2.51
child rearing									
yes	**1.29***	1.58	1.62	1.68	2.21	2.06	2.29	**1.85***	2.28
no	**1.71***	1.89	1.96	2.07	2.08	2.15	2.32	**2.51***	2.50
village									
Cloyne	1.50	1.46	1.48	2.05	1.96	2.14	2.16	2.50	2.42
Denbigh	1.78	1.75	2.02	2.27	1.92	1.98	2.19	2.74	2.28
Flinton	1.60	1.94	2.08	1.72	2.27	2.30	2.22	**1.75****	2.53
Ompah	1.53	2.00	1.75	2.00	2.57	2.15	2.53	2.79	2.45
income									
under 20 k	**1.21**	1.20	1.38	**1.33**	2.23	1.91	1.67	1.77	**1.44***
20 to 39 k	**1.45**	1.65	1.94	**2.06**	2.20	2.17	2.63	2.39	2.75
40 to 59 k	**1.88**	1.89	1.88	**1.48**	1.79	1.88	2.29	1.80	2.32
over 60 k	**1.71**	1.89	2.04	**2.08**	1.98	2.15	2.21	2.50	2.64
residence status									
seasonal	1.52	1.90	1.76	**2.73***	**2.78***	2.52	2.00	**3.41****	2.64
permanent	1.61	1.82	1.89	**1.99***	**2.13***	2.12	2.32	**2.37****	2.43

Bold indicates difference at p<0.1, * indicates difference is significant at p<0.05, ** indicates difference is significant p<0.01, for 2 factors (gender, child-rearing, residence status) the Student T-test is used, for 3 and 4 factors (village, income) a one-way ANOVA with Tukey-b post-hoc test is use

4.2 Focus Group Findings

Consistent with the findings from the survey, participants in both focus groups generally supported RETs, and suggested that wind farms would likely be the most contentious technology. Residents expressed concern that seasonal residents or residents who had relocated from urban areas would be concerned with aesthetic impacts on the scenery. These expectations were not supported by survey data which show similar levels of support for wind farms between seasonal residents and permanent residents and no significant differences between long-term and newcomer residents. Some quotations from focus group participants to illustrate the types of concerns identified with wind technology include:

> "I sure as hell know they aren't going to put one of those wind farms on my property."
>
> "I wouldn't make this an urban / rural issue but in some respects I think it is. Rural people might be more used to seeing towers, because a lot of old farms had wind machines that pumped water...we are talking two generations ago but if you grew up in that situation....it is a different type of wind energy but it still involves a tower and blades and so I think people are more used to seeing that in the country."
>
> "You go to Wolfe Island, and it is almost a disgusting insulting thing when you look at the beauty and then this thing is just clustered with (...)it is producing nice energy but you have a huge challenge and I think it will continue wherever you go with 'not in my backyard"'
>
> "If you talk about two or three turbines on ____ Lake, there would certainly be a very different perspective from people that come up on only on weekends"
>
> "I think it is being maligned…it is popular to believe it is bad."

Box 1 - Profiles of the participants of focus group #1

Participant A – male retiree long-time resident, active in local hunting and fishing organization
Participant B – male, business owner, has solar panels under microFIT program, moved to area from urban centre
Participant C – male retiree active member of County-level "green energy task force", moved to area from urban centre
Participant D – female long-time resident, active in community organizations, lives off grid
Participant E – male, long-time resident, volunteer firefighter, lives off grid
Participant F – male retiree active in lake association moved to area from urban centre
Participant G – male retiree long-time resident active in local organizations
Participant H – male retiree, long-time resident active in local organizations

Although the survey results suggest strong support for solar panels on rooftops, there were several concerns that emerged in the focus group discussion. One participant provided a possible explanation for greater support seen in the survey by those in child-rearing families. He described the relevance of the microFIT incentive program for older residents thus:

> "This is turning into a retirement community. When you have someone coming in at the age of 65 and take a look at solar, which you get your return back in 10 or 12 years, and it costs you $70,000 to do, I don't think at 65 I'd be willing to put out the $70,000 to maybe live long enough to see some return on it"

The costs of the microFIT subsidy to taxpayers also generated discussion. In one of the exchanges one participant described his rooftop solar panels as a "*damn good investment*" but another felt the costs were too high to the Ontario taxpayer at which point several participants discussed if the costs of the nuclear alternatives were just as high. The argument that subsidizing RET is driving up electricity rates turned out to be a prominent criticism from opposition political parties during the run-up to the fall 2011 election and it is worth exploring the public perceptions of this argument in the EOH during the study period. It is made even more relevant by the fact that advocacy groups and national media claim that green energy concerns caused the governing party to lose seats in rural areas (Howlett K & Ladurantye, 2011; Wind Concerns Ontario, 2011). As reported above, focus group participants considered and discarded the argument that RET subsidies should be abandoned to avoid raising the price of electricity. The survey comments provide an additional measure of attitudes. Of the specific comments on electricity costs, seven blamed mismanagement of the provincial utility Hydro 1, five indicated there should be continued subsidies for installing solar or other forms of renewable energy and four said microFIT subsidies should be abandoned altogether. Below is a sample of the comments.

> "I would like the debt taken off of the Hydro bills as well as the HST. No one pays our debts so why should we have to pay Hydro's debt"

> "I have vacant land suitable for solar panels, but find it too costly to install. These should be made more available to people who want to assist the energy problem"

> "Power should be generated where it will be used without requiring subsidies reminiscent of Soviet Union fantasy economics. Personally I don't want to fund or suffer the consequences of Mcguinty's [Premier of Ontario] green dream simply so the provincial liberals can get a few more ridings in the Golden Horseshoe ridings"

Several participants in both focus groups expressed scepticism that solar panels would continue to be installed if there were changes in provincial policy after the election. The election completed in October 2011 saw the governing party returned to power albeit with less seats. At the time of writing the microFIT program remained intact but lower rates are expected for new solar installations.

When asked about the hydro-electric option participants in both focus groups were generally in favour of the technology but expressed a great deal of concern about

the number of approvals required from oversight bodies for water-ways. In the second focus group one participant recounted the seven year wait their hydro-electric project took between decision to go ahead and to producing electricity; "*there is not just one approval, there are 10 approvals.*" Flinton is one village that has seen officials from the Conservation Authority enter into agreements with private parties to develop hydro-electric power in the river running beside town but these plans have floundered for lack of expertise and start-up capital. Despite this, support for a hydro dam remains high in Flinton as seen in the survey responses and expanded on in survey comments such as *"At one time Flinton generated its own power plant at the Flinton Dam. Why not now??"* Some participants expressed doubt that municipalities would lead projects to convert existing dams to produce electricity. Some quotations that reflect the discussion are:

> "They will struggle with the long-term commitment."
>
> "If some municipal government says yes we are going to do this, they aren't going to see the benefit during their period of power so it is difficult for them to champion a project like that."
>
> "We have so much potential for water and one of the biggest obstacles I see is the red tape."

Diverting water to generate power, even in the case of a pre-existing dam, raised concern among some participants in the first focus group that water levels for recreational activities and for fish habitat would be compromised, a reality also recognized by officials in the second focus group. Concerns about water levels may be behind the significantly less enthusiastic responses to hydro-electric options from the survey sample of seasonal residents, most of whom own water-front property.

The discussion of the biomass energy option brought out some enthusiastic responses from both groups. Unlike the wind, solar and hydro examples no negative opinions were expressed in the first focus group, while the only concern expressed in the second focus group was uncertainty over the ease with which forestry operators could change from existing tree removal practices to providing for pellet production. Participants saw a wood pellet factory as a logical follow-up to the planned installation of a wood pellet boiler at the region's school. The following quotations reflect the discussion:

> "We've got just incredible amounts of sawdust and bark and trimmings and wood….to me this is an ideal opportunity for somebody to come along and open a pellet plant somewhere within easy distance."
>
> "I love the concept over in North Addington [i.e. at the school - North Addington Education Centre]. I think that is great, now if we only can get the pellets here."
>
> "This could be a product that has many many other spinoffs."

Participants in the focus group for residents shared ideas on actions that might promote greater uptake of local renewable energy production, and in doing so, some reflected on how everyday conversations connect to political decisions. One participant related a story of people knocking on his door to ask him about the outdoor wood boiler on his property, and concluded by saying, "*I think that is the*

kind of thing that promotes it [a move towards renewable energy]" He picked up on the language used by another participant to say "*You have to keep highlighting that there are alternatives to the cord from the pole"* and put forth the idea of "diversification workshops." A different participant welcomed this and added the idea of tours of local hydro dam sites, solar panels, geothermal heating or other renewable energy technologies. Another participant was supportive of this idea, and gave the example of a community-owned, ground-mounted solar farm from a neighbouring county as an example to learn from. Near the conclusion of the first focus group, one participant observed "*if you don't attend something like this [focus group] you get so damned insulated that you can't see the forest from the trees*."

5.0 Discussion

Our findings suggest residents of the Eastern Ontario Highlands have a strong level of support for alternative ways to generate energy. This is true when the question is framed generally and when specific types different RET in their own backyard are provided as examples. The biggest reason to support alternatives appears to be a general dissatisfaction with rising electricity prices, but there is also a strong interest in harnessing local energy sources. Comments from survey respondents and from focus group discussion show that some see RETs as economic development in an area that is struggling; others see it as part of being well-prepared for disruptions to conventional energy supplies.

In a region where a high proportion of residents use wood to heat their homes, it is perhaps unsurprising that support for wood-based RET was high. There was unanimous agreement in the focus groups for a wood pellet factory, and 68% agreement from survey respondents with those who currently use wood pellet stoves the strongest supporters. For many residents, wood is simply the cheapest and most readily available option, and this fact seems to translate into higher levels of support for biomass energy than has been identified in existing scholarly research, particularly studies coming out of the United Kingdom (Upham & Shackley, 2006; Upham, Shackley, & Waterman, 2007). Wood-pellets garnered a high level of "neutral" responses in the survey. It is unclear if the neutral stance is because few have experience with what a wood pellet factory might look like, or because people are unsure what the pellets would be used for. When the opportunity to discuss the example was given in the focus groups, participants were very enthusiastic about the installation of a wood-pellet boiler at the school. Concerns were raised about the fact that the School Board that manages the installation is assessing wood pellet supply tenders from seven bidders across southern Ontario and into Quebec, none of which manufactures pellets in the study region. If no local pellet supplier emerges in coming years, local attitudes towards this project could quickly change, given how much raw wood product is locally available, and given the large number of residents engaged in forestry.

Residents also strongly supported solar RETs. Positive opinion was high for rooftop installations (87%) and for solar farms (79%), indicating that the technology itself is seen as benign even when prominently visible and taking up a large area (one solar farm south of the study area takes up 40 ha). Early adopters of the microFIT program have been publicized in the local paper, and the technology is easily visible on many roofs along highways in the region. This likely contributes to the high public awareness of the technology, and possibly contributes to the high levels of support with a technology people have become familiar with.

There is some underlying concern related to the price being paid by the provincial power authority for electricity generated by solar photovoltaic technology. Several focus group participants and survey respondents expressed views that the FIT incentive program is wasteful, echoing views often given in mainstream media and by political opposition parties. On the other hand, even with the arguments against solar subsidies circulating in the public sphere, some residents call for even further subsidies to support local RET developments. It was also interesting to observe that wasteful subsidy opinions tended to become moderated in the focus groups when the cost of the nuclear energy option was raised. This may have been due to the high sensitivity and public awareness of Japan's Fukushima nuclear power plant disaster, which was still in its early stages when the focus groups were held and referenced by several participants. This would imply that at least some residents would accept higher priced electricity if it came from "safe", "local" sources. This finding must be regarded as tenuous however as EOH residents show a very strong preference for keeping costs of electricity low. A longitudinal survey of EOH residents with sampling periods that incorporate future changes in electricity rates and in government incentive programs would provide better evidence to fully assess public perceptions of the costs of RET incentives.

One concern about the FIT incentive program that is not widely expressed in media is how the 10 year payback period may be too long for many older residents. Given that rural populations like those in the Eastern Ontario Highlands tend to have higher average ages, this may warrant further reflection by policymakers seeking to offer incentives for renewable energy production in these communities.

Residents were in favour of using falling water to generate electricity, but more so for existing dams versus constructing new dams (73% versus 58%). The greatest barrier that came through in the focus groups was a perceived excessive number of regulatory approvals required to get at the water. There was also concern about changing water levels on recreational activities and fish habitat. Potential hydro project proponents should be prepared to mitigate these concerns with clear communication with residents.

From the second focus group there was great deal of discussion about what would motivate a municipality to pursue a hydro-electric project. Having a partner like a Conservation Authority which has the in-house capacity to perform environmental impact assessments was deemed important, as was creating a number of working demonstration projects in the area to attract risk-averse investors (both public and private) to hydroelectric RETs.

The NIMBY response is a favourite explanation for those who suggest people will oppose any new buildings or new technology close to their property. Relatively few survey respondents expressed the classic NIMBY response (11%). It was indicated most frequently with respect to wind turbines. The higher level of support expressed by lower income individuals is consistent with explanations from van der Horst (2007) and Brannstrom et al. (2011) who find depressed areas in economic decline are more likely to host wind-farms. The proportion of those disagreeing with a wind farm in the region (25%) is in line with the review of surveys carried out by Devine-Wright (2007) who suggest 20% opposition is common. Prior opinion surveys for eastern Ontario are rare. One was carried out for Ontario bird-watchers, a group that is highly sensitive to the impact of wind turbines on birds, and found 22% disagreed with wind energy (Cheskey & Zedan, 2010). Another measure of public response to wind farm development comes from

Hill et al. (2010) who document an increase from 20 to 45 in the number of local groups across Ontario joining the provincial anti-wind organization Wind Concerns Ontario between 2008 and 2010.

Results from both the focus group discussion and the survey suggest seasonal residents of the Eastern Ontario Highlands are a group that resists change to the environmental amenities that directly influence the enjoyment of their properties, specifically lakes and forests. Any development of RET in the region may face opposition from this group, particularly for hydro-electric power and possibly a wood pellet plant. This tension is characteristic of trends towards post-productivism in rural areas like the Eastern Ontario Highlands whereby tourism generates capital tied to idyllic rural representations of landscapes and less wealth is generated from "productive" use of the land such as forestry and mining (Bryant & Johnston, 1992; Ilbery & Bowler, 1998; Woods, 2003). It is a reality that planners should address especially considering the large numbers of seasonal and recreational properties in other rural regions of Ontario experiencing RET developments (e.g. Huron and Bruce Counties) and the strong likelihood of RET expansion elsewhere in North America. However, it would be inaccurate to portray all seasonal residents as anti-RET development. Many cottages are remote and off-grid due to lack of electricity lines; some cottage owners use solar, wind and geothermal power and contribute to an expanding knowledge base of alternative energy production in the EOH region and elsewhere. Further case studies focussed on the views of seasonal residents in rural regions in Ontario and elsewhere could contribute more detailed advice to rural planners.

Overall our findings suggest that residents in the Eastern Ontario Highlands generally hold a positive attitude towards all new RETs and that, at least with respect to solar installations, this positive attitude endures even after RET infrastructure is built. Our suggestion is that planners may be able to foster this attitude by engaging rural residents through participatory planning, through demonstration and with regular consultation of residents (including seasonal cottage owners) during project proposals. Residents are particularly enthusiastic when local resources are used in the development of non-conventional energy options.

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