Power to the People

Thinking (and rethinking) energy poverty in British Columbia, Canada

by

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Abstract

Energy poverty, or the experience of struggling to meet one's energy needs, is increasingly the subject of attention in Canada — though no established definition for it exists and the definitions that are used often obscure its connections with the systemic processes that create it. In this dissertation, I situate energy poverty as a justice issue and operationalize various understandings of justice (distributive, procedural, recognition-based and restorative) to discuss how energy poverty may be conceptualized in the settler-colonial context of Canada, and, indeed, how different conceptualization reveal different processes of its creation, as well as different approaches to addressing it.

Based on empirical work with two First Nations communities in British Columbia (Musqueam and Tsay Keh Dene), I outline the unfolding of energy poverty in BC amidst a constructed narrative of energy plenty, which aims to expand the reach of the extractive energy industry in the province. In doing so, I link specific energy planning processes that create precarious energy access, with mundane details of how energy poverty manifests itself in household practices that use energy. This linking of the experience of those who experience energy poverty and energy planning processes that create it reveals not only how industrial energy demand in BC is privileged over residential energy use broadly, but also how the energy demands of off-grid indigenous communities such as Tsay Keh are deemed 'artificial and illegitimate in the community energy planning process.

This ethnographic work (including surveys, interviews, energy mapping exercises and energy analytics) is complemented with a statistical analysis of data from Statistics Canadas Survey of Household Spending. This analysis highlights patterns in energy poverty across Canada and demonstrates a gap between the experience of energy poverty and the design and targeting of the residential energy retrofit programs that aim to address it. I conclude by making a series of recommendations for those who fight for energy justice, including the development of community-based energy programming (e.g. deep

retrofits and community renewable projects) and broadening the scope of energy poverty alleviation programs from a focus on low-income households to include lower-middle class households as well.

Lay Summary

In this dissertation, I look at the experience of households and communities that struggle with meeting their energy needs. This experience is referred to as 'energy poverty' and I investigate it here from several perspectives, including spending a disproportionately large part of ones income on paying for electricity and heat, having to compromise on comfort, cleanliness and convenience, and feeling excluded from energy planning processes that shape a communitys energy future.

I, then, link this experience with resource planning paradigms and moments in energy planning practices that privilege some energy demands over others in British Columbia. Then, drawing upon work with Tsay Keh Dene and Musqueam Nations (two communities that experience and manage energy poverty differently), I explore two approaches (developing community energy projects and doing household energy retrofits) to addressing energy poverty.

Preface

This dissertation is an original intellectual product of the author, Maryam Rezaei. The fieldwork reported in Chapters 4-6 was covered by UBC Ethics Certificate numbers H11-00009, H12-03044, and H12-00071. Some of the interview materials presented in Chapter 4 also appear in Rezaei, M and Dowlatabadi, H (2015). I designed the study described in this paper, conducted the research, analyzed the material and wrote the paper. Hadi Dowalatabadi provided editorial and supervisory feedback on the various stages of that work.

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I'm grateful for the weekly reminders from the Humanities 101 program, during two dark years of this PhD affair, of the fact that education can actually be interesting, relevant, challenging, and empowering. I'm so honoured to have been a part of this program.

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Chapter 1

Introduction

On September 27th 2016, Catherine McKenna, the Minister of Environment and Climate Change, Jim Carr, the Minister of Natural Resources, and Dominic LeBlanc, the Minister of Fisheries, Oceans and the Canadian Coast Guard flew to Vancouver, where they were joined by the British Columbia Premiere, Christy Clark, to hurriedly announce the federal government's approval of the Pacific Northwest Liquified Natural Gas (LNG) project, owned in majority by Malaysia's state-owned Petronas. During the press question period, a woman, holding a jar of salmon, wearing a cedar hat and a blanket with an indigenous crest stepped to the front, interrupting the moderator:

> **Moderator:** [Simultaneous with Christine] We'll take one more question from the floor, from the press please, who are here to ask questions.
>
> **Christine:** A question here - My name is Christine Smith-Martin and I'm from Gitwilgyoots of the Lax Kw'alaams and my question is to you [Moderator: We're taking questions from the press, we're running out of time here. Thank you very much]: the salmon that we're talking about in our community is a very important piece and you're not addressing the salmon. [Journalist starts asking her question] What about our salmon in our community? Answer the question. Our chiefs are out in Ottawa right now, waiting for you guys.
>
> **Journalist:** [identifies herself, but the recording is inaudible] A lot of people are not going to be clearly satisfied with the process and with the decision made here. They're threatening protest. They're already threatening legal action. How will you respond to that?

Christy Clark, who is also sporting a blazer with an indigenous crest (how many of these does she have?), clarifies with someone that it's she who should answer the question. Then, responds, facing the journalist:

> **Christy Clark:** I will say, just like Site C, which is a clean energy project, which is going to benefit our children for a generation with low cost clean energy, in an era where people are getting hungry for clean energy, it is impossible to move ahead with a major economic project that has 100% support. But I will say with respect to this project, we worked for five years with First Nations and communities around the North. And we worked on economic benefit agreements, employment agreements, ensuring that First Nations are a part of ensuring environmental sustainability and as a result of that work we have received, not unanimous, but overwhelming support from First Nations and other communities around the country. [some one yells: what about our salmon?] And I think that sometimes governments need to lead. And for us, leadership means moving ahead on projects that are going to be environmentally sound [someone else yells: like (inaudible) residential schools?] and benefit the people of British Columbia and ensure that we're creating jobs and looking after the middle class in our province.

Sometimes governments need to lead. In the case of the liquified natural gas industry, the current government of British Columbia has been *leading* hard to create an LNG industry in the province, purportedly to take the abundant supplies of gas in North Eastern BC to new markets in Asia. This 'leading' goes on despite market conditions that at least in the medium term make economies of LNG export highly unfavourable (IEA, 2016). The Pacific Northwest LNG project which proposes to bring natural gas from North Eastern British Columbia to a liquefaction facility on LeLu island, is in fact, supported by the government of British Columbia in multiple ways. For one, as part of a deal struck between Petronas and the BC government (and also applicable to other LNG facilities), future governments, for 25 years, are required to compensate the industry if they raise income tax rates for LNG operations, or if they reduce the current subsidies to the gas industry (e.g. natural gas tax credits), add carbon taxes that single out the industry, or if they make changes to GHG emission regulations that financially affect the industry (Province of British Columbia and Pacific North West Limited Partnership, 2015, see). Much of the risk in the development of the industry is, then, transferred to BC publics.

But the government of British Columbia's support for the LNG goes even further with implications for the provincial energy policy more broadly. More specifically, the government's support of the LNG industry goes as far as promising a cheap supply of hydroelectricity. The provincial electric utility company, BC Hydro is, therefore, left to increase its supply capacity to accommodate the expected increase in provincial electricity demand. BC Hydro's latest Integrated Resource Plan (IRP) (2013), in fact, explicitly plans for meeting LNG demands (see Figure 1.1), noting that the LNG industry will probably meet its compression needs by burning natural gas rather than using electricity. It nonetheless anticipates 3,000 GWh/year of increased energy demand for non-compressive loads corresponding to about 360 MW of peak demand by 2020 (BC Hydro, 2013, 2-2). To contextualize these values, the contested Site C hydroelectric project that Christy Clark mentions in her response above is expected to produce about 5,100GWh/year of electricity each year. In other words, about 60% of Site C's expected annual output is being earmarked for the LNG industry. Site C, again, represents a 9 billion dollar investment by the BC publics, mostly to meet the demands of an industry that the government is courting.

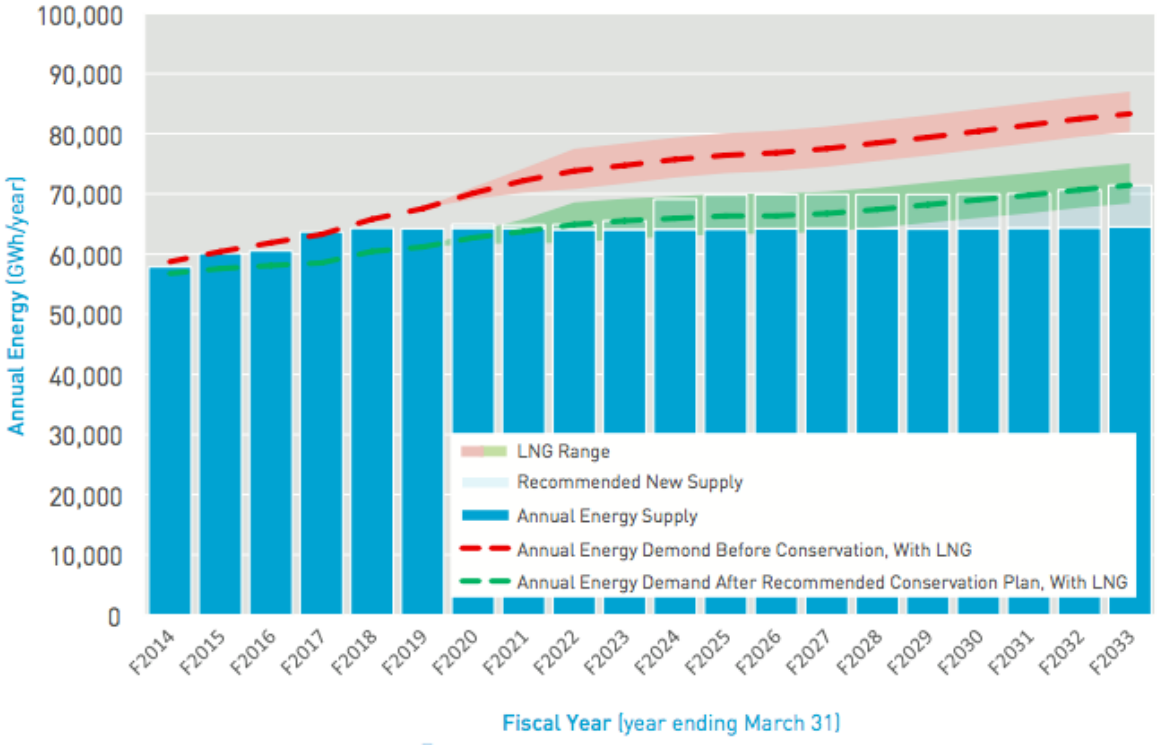

Figure 1.1: Image from BC Hydro's 2013 IRP projecting future electricity demands

Most importantly, in the case of Site C, these expenses are directly financed by BC Hydro rate payers, who have seen an increase of 20% on their electricity bills over the past 3 years and will continue to

see price increases in the future. The impact of these rate increases on those who are already struggling with paying energy bills receives little attention in the discourse around energy development in BC, even as it's being actively exacerbated by provincial energy policy. Energy poverty, or the experience of having a hard time in meeting one's energy needs, affected 16% of British Columbians in 2011(see Chapter 3), and though statistical data for the past few years reflecting the electricity price increases is not yet available, it is expected that the number of those who experience energy poverty has grown and will continue to grow. Yet, even as the concept of energy poverty is gaining ground in the Canadian energy policy discourse (see, for example, recent publications by the Canadian Centre for Policy Alternatives (Lee et al., 2011) and the Fraser Institute (Green et al., 2016)), it is rarely discussed in the context of (or as a consequence of) particular energy planning and extraction processes.

I open this Introduction chapter with the announcement of the federal approval of this LNG project to highlight its links with electricity planning in BC and the effects on incidences of energy poverty of an approach to electricity policy that prioritizes industrial energy demand. However, this approach is more than a contemporary problem in BC. Prioritizing industrial electricity demand, particularly for extractive industries that do not yet exist in the province (and often never materialize), has a long history in British Columbia. Starting in the post-war period, the government of British Columbia has pursued an economic development agenda which has aimed to attract extractive capital to the province and enticing it to process its extractions locally by promising a cheap supply of electricity (as well as easy access to markets). This provincial approach to electricity planning has had important implications for BC's electricity sector, including the glut of electricity in 80's, which ultimately led to reforms in the sector through the creation of the BC Utilities commission. However, (whether tragedy or farce) the government of British Columbia in recent years has returned to its old approach to electricity planning, so much so that the development of Site C dam, the first major dam to be constructed in the province since the completion of the Revelstoke dam in 1984, was exempted from a review by the Utilities Commission.

I also open with this announcement because this LNG project and the Site C dam, which it necessitates, are all part of the creation of a discourse of 'energy plenty' in British Columbia. In 2014, Canada was the world's 4th largest producer of natural gas and 5th largest producer of crude oil (Natural Resources Canada, 2015). While Alberta currently accounts for about 63% of all primary energy production in Canada, British Columbia comes second at about 14% of total primary energy produc-

tion(Natural Resources Canada, 2016). The government of British Columbia would certainly prefer that percentage to be higher, and actively works towards that outcome and the creation of an 'energy plentiful' BC. During the same announcement, for example, Christy Clark said that "British Columbia has as much natural gas — as much energy stored under the earth in the northeast as Alberta does in its oilfields." Whether this statement is factually accurate or not (and it may or may not be depending on what you count as exctractable energy), it is part of the discourse of 'energy plenty' in BC, which aims to grow the natural gas industry in the province (and electricity production along with it, to support its electric demands). This 'energy plenty,' of course, is an interesting artifact in the context of the real 'energy poverty' that it seems to create for some people in British Columbia.

Both the Pacific North West LNG project and Site C have encountered heavy opposition within BC, including over the financial risks and burdens placed on the publics in their development. Opposition to both projects, however, also includes a host of issues ranging from environmental concerns (Climate change, earthquakes due to hydraulic fracturing (fracking) and loss of significant salmon habitat in the case of the LNG projects), to food security concerns (loss of significant salmon habitat and farming land in the case of Site C) and to violation of indigenous rights (in both cases). Many First Nations communities along the path of pipelines that would transport this natural gas to the coast and treaty 8 Nations whose lands are due to be flooded by the Site C dam are opposed to these developments. At the time of writing, though both projects have received federal and provincial regulatory approvals (or what stood in for provincial regulatory approval in the case of Site C), there are ongoing court challenges from First Nations communities impacted by the projects. The communities challenging these projects are encouraged by the fact that the federal approval of another energy project with a significant footprint in BC – the Northern Gateway Project– was recently overturned by the Federal Court of Appeal due to its failure to properly consult several First Nations communities impacted by the project. While the outcome of these court challenges are interesting in their own rights (and certainly a much more vital matter for some communities), I mention the opposition of many First Nations communities to these projects to highlight another key tension between the 'energy plenty' of British Columbia and its 'energy poverty' — namely, that some of the most extreme forms of energy poverty in the province are experienced by First Nations communities, particularly those who are remote (relative to my discursively central position in Vancouver, but also to the materiality of roads and energy transmission infrastructure).

Energy poverty in BC, then, unfolds amidst a constructed narrative of energy plenty created to expand the extractive energy industry in the province, and its parallel contentious energy policy made material (and resisted) in the forms of pipelines and dams. Investigating the colonial-extractivist policies of 'resource development' and the ways that they have historically and contemporarily unfolded to create particular patterns of energy access is at the core of studying energy poverty— if the goal of such a study is indeed to highlight the systemic processes that bring it about, rather than presenting it as an isolated problem experienced by some individuals.

1.1 Energy poverty

When I started the research which eventually became this dissertation, 'energy poverty' was a term rarely used in the Canadian context. A few public advocacy organizations in different provinces used the phrase 'energy poverty', mainly focusing on the household energy burden faced by low-income people in Canada, as well as some in the energy efficiency community who were interested in using 'energy poverty' as a framework for their work. The only analysis of energy poverty, in fact, was a background paper to a conference organized by a small Ontario-based NGO, Green Communities Canada, entitled "Tackling energy poverty in Canada through energy efficiency" (Maynes, 2008). The background paper included a statistical analysis on energy expenditures in Canada, as well as some discussion of how energy poverty may be defined using an expenditure based measure. The key question in using this class of definitions is where to draw the energy poverty threshold among the values for percentage of household incomes spent on energy services — a question which the aforementioned background paper raises, makes helpful suggestions on and then leaves open to discussion.

Though the public discourse on energy access is still fairly limited, since Maynes' (2008) background paper, two of Canada's most prominent policy think tanks have published reports on energy poverty. Purportedly occupying opposite sides of the political spectrum, the publications by both the Fraser Institute (2016) and the Canadian Centre for Policy Alternatives (2011) use the same expenditure-based definition of energy poverty, borrowed from the UK without attention to detail, and without engaging with the question of whether it is appropriate for Canada. While the United Kingdom has since changed its policy definition for energy poverty, there were a couple of elements of the former definition which the analyses by the CCPA and the Fraser Institute neglected. First, is the choice of threshold at 10% of household expenditure, which was originally set in the UK context as a relative measure of

poverty — in other words, the threshold was set at two times the national median, which happened to be 10% in that context (Boardman, 2010). Using a similar approach for Canada would yield a threshold of between 6 and 7 percent of net household income beyond which a household may be said to be shouldering higher energy burdens (see chapter 3).

Second, the UK definition served a particular purpose in the UK energy poverty context — it was mostly a definition used for policy level calculations and decisions, and in fact, defined energy poverty as the experience of a household who *would need to* spend more than 10% of its income on meeting its energy needs, regardless of whether the household actually did or not. This 'needing to' spend stipulation meant that in practice determining how many households suffered from higher energy burdens was done through an energy modelling exercise paired with sociodemographic statistics (Boardman, 2010, pp. 4-5). Though there are certainly concerns with the ability of models to accurately capture household behaviour, the 'would need to' clause has the benefit of potentially capturing households that may not be heating their homes adequately in order to save money on their bills. In practice, for purposes of program implementation, such as determining eligibility for winter fuel subsidies, however, often a measure of vulnerability was used (e.g. senior citizen or disability status, or the presence of young children in the house).

What is important to note is that different definitions of energy poverty can serve different functions. For the purpose of policy-level decisions, an actual expenditure based measure may be complemented with subjective measures of household's ability to maintain thermal comfort, avoiding the modelling exercise all together. For analytical examinations of how energy poverty comes about, it might still be more appropriate to use an abstract qualitative definition (such as inability to meet one's energy needs), or vary the unit of analysis from household to community-level. For examination of the ways in which energy poverty may affect people who experience it, it may indeed be more appropriate to allow them to highlight facets of the experience rather than prematurely zeroing in on specific aspects like the ability to maintain thermal comfort.

This dissertation is the first academic exploration of energy poverty in Canada (as far as I'm aware). For this reason, I have deliberately worked with a fairly broad definition of energy poverty, and adapted the indicators that I use in discussing it to best suit the questions I address in each chapter. Throughout this dissertation, therefore, I use the terms 'energy poverty', 'precarious energy access', 'experience of higher energy burdens' and others like them interchangeably to broadly mean *struggling with meeting*

one's energy needs. What counts as an energy need, what it means to struggle and what unit of analysis does 'one' refer to are, then, questions that I explore, rather than taking them as given.

1.2 Outlining this dissertation

In the following chapter, I present a review of the literature on energy poverty and construct a theoretical framework, based on theories of justice for discussions of energy poverty and more broadly energy justice in Canada. This framework starts with Walker's (2012) simple anatomy of a justice claim as a way of organizing the material in this dissertation. This framework suggests that a justice claim should be composed of a description of an inequality, a discussion of how that inequality affects those who experience it (or why that matters) and an analysis of how it comes about. To this suggestion I add a fourth element: some discussion of what justice in the context of addressing that inequality might look like. In doing so, I include discussions of some of the policy instruments used for addressing energy poverty and some that perhaps should be. Next, in chapter 3, I present an overview of the trends in energy poverty in Canada using a relative and expenditure-based definition and data from Statistics Canada's Survey of Household Spending. Then, having outlined some of the trends in energy poverty across the Canadian Provinces[1], I go on to analyze energy poverty and its relationship with income poverty.

Beyond the overview of energy poverty across Canada that I present in Chapter 3, I discuss energy poverty and justice in the specific context of British Columbia, and more specifically grounded in work completed in collaboration with two First Nations communities in BC — Tsay Keh Dene, an off-grid community, and Musqueam, a community with access to the electricity grid and natural gas distribution networks. My work with these communities was inspired by my supervisor's existing relationships with these communities and in each community it evolved to reflect the community's particular interests and energy pain points. In Musqueam, households were experiencing high energy burdens; So the project that we designed aimed at improving the energy performance of the homes. Tsay Keh was in the midst of designing its own community renewable energy project, and understanding household consumption was key to its ability to develop an energy forecast that the various parties involved in the project could

[1] the 2011 cycle of the Household spending survey which I used for my analysis does not include the northern territories. This was the last cycle I had access to at the start of my analysis. The 2012 cycle became available during the course of my analysis. However, though conducted in the territories, it did not use measures that are consistent with the provinces and therefore excluded the territories from the dataset, again. I continued using the 2011 cycle.

agree to; my work in Tsay Keh, therefore, focused on understanding household practices that use energy.

The two communities and their differing locations in networks of energy infrastructure also presented interesting perspectives on the role of energy infrastructure in shaping the dynamics of energy poverty in the context of the provincial energy policy. It is my hope that in grounding this work in the specifics of these communities I will be able to not only shed light on some of the more severe cases of energy poverty but also reveal the processes that produce energy poverty in British Columbia (perhaps not just for First Nations communities, but for settler communities as well) as processes that are deeply enmeshed with the colonial-extractivist pursuits which form the backbone of the government of BC's economic development and energy policies.

I suggested that First Nations communities, particularly those that live in off-grid communities tend to experience some of the most severe forms of energy poverty. However, the extent of energy poverty in Northern and First Nations communities is largely unknown for both on and off-grid communities. Neither Statistics Canada, nor Natural Resources Canada or Indigenous and Northern Affairs Canada (INAC), which is often responsible for funding energy infrastructure and fuel in the case of remote communities, collect data on energy use on reserve. In BC, while some Nations have collected some of this data in support of particular energy projects, different data collection methodologies are often used including varying timeframes for the data collected, and different foci on residential and/or commercial facilities. Furthermore, the collating of this data, even if it existed in a consistent format, would require the consent and collaboration of many Nations. As a result, the extent of the problem remains poorly understood. What is known, however, is that electricity costs in remote communities in Canada are between 3 and 10 times higher than grid-connected electricity (Weis et al., 2008; Rezaei and Dowlatabadi, 2015). And where propane is used for heating, it costs up to 10 times what natural gas costs per unit of energy (see Chapter 4). All of this does not even take into account the fact that appliances, on reserve, tend to be less energy efficient (see Chapter 6), meaning that to achieve the same level of service, more energy must be consumed in the first place. My other hope is that this dissertation, in documenting the state of energy access in Tsay Keh and Musqueam, can provide some evidence of the claim that First Nations communities experience some of the most severe forms of energy poverty.

The empirical chapters that follow attempt to do the following: Chapter 4 documents modes of energy access in Tsay Keh, describing the relatively high burden of accessing energy services in this community, while discussing how this inequality in energy access affects the lives of families in Tsay

Keh. This chapter uses a theoretical framework which sees energy as an ingredient of many household practices and documents the ways in which trouble in accessing energy as part of these practices require sacrificing comfort, convenience, cleanliness and also often, dignity. Chapter 5 presents an overview of BC energy policy starting in the 1950s and into the mid 80s which directly shapes specific facets of energy poverty in Tsay Keh. It then turns to the contemporary question of addressing this energy poverty in line with community desires for a community renewable energy project and discusses how current energy planning practices of the provincial electric utility company continue to reinforce Tsay Keh's energy poverty. Chapter 6 presents a brief description of the ways in which energy poverty is experienced in Musqueam and discusses the use of household energy efficiency retrofits as a common policy tool for addressing energy poverty. In evaluating the process of delivering energy efficiency retrofits to households in Musqueam as part of the BC Hydro Energy Conservation Assistance Program (ECAP) this chapter also demonstrates the limitations of such programs in addressing higher energy burdens.

1.3 A note on terminology

There are a few terms that I should clarify before beginning this dissertation in earnest. First is the term **poverty**, which I view as fundamentally a matter of relative disadvantage. I do not mean to suggest that there is no material core to the experience of poverty (indeed, the material survival of many individuals and households in poverty is at stake in this discussion). Rather, I consider this securing of material survival a particular problem, only because it affects some, while others live lives of plenty and profligacy. Poverty and energy poverty, then, are problems (from a justice perspective) precisely because some people do not have access to what is socially and materially necessary to go on living lives of full participation and dignity in their communities. Access to resources (energy included) not only help ensure material survival, but also allow participation in activities that make up social life. Different chapters of this dissertation, in fact, shed light on some of the ways in which struggling to access energy services affect people's ability to perform the living of lives that are deemed socially acceptable, free of stigma, and full of dignity. The Theory chapter (Chapter 2), expands on this idea, but for now suffice it to say that when I say poverty, I mean poverty in relative terms.

Next is the matter of some of the more technical terms I use to talk about energy. Energy, is the ability to perform work, stored in **energy carriers**, such as propane, natural gas, electricity, and coal.

This ability may be unleashed through various conversion processes to yield **energy services**, which are things like hot water, refrigeration, and lighting. **Energy efficiency** is a term that describes how much of the stored energy was converted to the desired service, rather than wasted.

And last on this eclectic list of terminology clarification is the set of terms I use to talk about the indigenous people of Turtle Island (north America). In Canada, **First Nations** is the term most commonly used to refer to indigenous people who live south of the Arctic circle. I use both 'First Nations' and 'indigenous' to refer to these groups of people. When speaking about their political organization in communities, I use the term **Nation** — and when specifically talking about governments elected on biannual cycles under the Canadian Indian Act, I use terms like ''nation's elected government" or **band council government**. Some of my interviews refer to this entity as **the band**, and this term appears in my text, on occasion, particularly when someone else uses the term.

The relationship between various Nations (or rather 'band council governments' as things that sometimes represent Nation's interests and are predominately responsible to their members, but also under the Indian Act, to the government of Canada) and the Canadian federal government is managed through the ministry of **Indigenous and Northern Affairs Canada (INAC)**. However, in the years that I have been working on this dissertation, this ministry has gone by three different names: Indian and Northern Affairs Canada (also INAC), and Aboriginal Affairs and Northern Development Canada (AANDC) under the Conservative government, and Indigenous and Northern Affairs Canada (INAC) under the Liberal government. I use the latter term in this text for the sake of being consistent, however, when my interviewees refer to them, I've kept whatever acronym they used (I do so because this constant name changing says a lot about the way settler-colonial Canada struggles with its relationship with the indigenous nations whose territories it occupies and because I enjoy the opportunity to draw attention to this fact).

Chapter 2

Theory

The earliest investigations of energy poverty in OECD countries define it as a situation where a household would have to spend more than 10% of its income on maintaining comfortable temperatures in their homes. In fact, the UK, which remains one of only three European countries to have an official definition of energy poverty and policy directives for its eradication (Thomson and Snell, 2013), until very recently relied on this definition in its estimations of the severity and extent of energy poverty. It defined comfortable temperatures as 21°C for the main living area and 18°C for other rooms. These values, though arbitrary, seem to have been taken from a range recommended in a WHO (1987) report on requirements for thermal comfort (Hills, 2012). However, the normative and quantified notion of comfort employed in this class of definitions, not only relies on data that is now 30 years old, but also contradicts field reports of temperatures and conditions in which people report being comfortable (see Shove, 2003, for a discussion). Furthermore, the thermodynamic energy modelling that determines the amount and cost of energy used is based on estimation of heating requirement for 'typical' households, in particular climates, with particular patterns of occupancy. It also ignores the multitude of ways in which people's interactions with their built environment diverges from the technical conditions envisioned at the design stage of this built environment. Even more important, still, is the fact that this conception of energy use and energy poverty takes no account of the experience of the 'condition' it tries to quantify.

In practice, most studies of energy poverty that operationalize this class of definitions (see Boardman, 2010; Healy and Clinch, 2002; Santamouris et al., 2007, for example) consider actual household energy expenditures rather than relying on arbitrary estimations and calculations (Healy, 2004). How-

ever, relying on energy expenditures obscures the experience of those who, for example, intentionally heat their homes to lower than comfortable temperatures in order to manage their bills. In fact, empirical studies show this group to be particularly difficult to identify for policy implementation purposes (Dubois, 2012). Attempting to capture these experiences, more recent studies of energy poverty use subjective and consensual (Townsend, 1962) measures such as ratings of households' ability to keep their homes at a comfortable temperature (Healy, 2004; Thomson and Snell, 2013). However, there is generally poor overlap reported between the expenditure-based measures and the subjective ones (Dubois, 2012; Fahmy et al., 2011; Scott et al., 2008; Price et al., 2012).

Regardless of the measures used in quantifying the experience (and the robustness of these measures) this earlier literature was predominately concerned with identifying the socio-demographic groups most vulnerable to the experience of energy poverty, and the "determinants" of this experience. Energy poverty in this literature was conceptualized as the interaction between energy prices, low incomes and household energy efficiency (Boardman, 1991). Though policy was an ever present fixture in this literature, the understanding of energy poverty underpinning most of these studies implicitly seems to be an apolitical one where energy poverty is often presented as a techno-economic problem with techno-economic solutions.

A shift from the techno-economic conceptualization of energy poverty began when a number of more recent studies expanded discussions around its "determinants" and conceptualization to include issues of access to networks of infrastructure and regulatory and governance regimes that create unequal energy access in the first place. The work of a number of geographers, Stefan Bouzarovski's in particular, have highlighted the role of access to infrastructure like the natural gas network (Buzar, 2007a; Harrison, 2010), and the policy and regulatory regimes within which the provision of energy services take place (Buzar, 2007b; Bouzarovski et al., 2012). Collectively, these more recent studies point to governance questions and in exploring them attempt shifting analytical levels from the household to questions of governance and regulation.

Starting with discussions around the inclusion of subjective measures of energy poverty, a parallel stream of the literature began engaging with the experience of the households grappling with the problems of precarious energy access. Though, there are few qualitative studies that take account of the lived experience of energy poverty (Middlemiss and Gillard, 2015), studies such as those by Anderson et al. (2012), Harrington et al. (2005) and Brunner and Spitzer (2011) have investigated the coping strategies

employed by households living in cold homes. Documenting the increasingly more desperate measures taken by households experiencing energy poverty, these studies predominately focus on the experience of feeling cold and the ways in which households manage it. There are, however a few curious absences in these studies. One is the absence of investigations into ways in which energy poverty is experienced at home beyond the experience of the cold. The exclusive focus on 'feeling cold', and its health implications leaves the literature curiously silent on manifestations of energy poverty at home beyond the experience of the cold. Certainly, the experience of the cold, is an important manifestation of the problem of precarious energy access, however we may wonder if there are other manifestations of precarious energy access that the literature is not exploring and what the implications of this absence might be on understandings of energy poverty.

A further absence in the qualitative studies of energy poverty is the integration of the discussions around understanding energy not as a commodity but in terms of the services it provides. While exploring the manifestations of energy poverty in households' experiences of maintaining thermal comfort is indeed reflective of an understanding of energy in terms of a service that it provides, this type of analysis usually lacks a full engagement with the social scientific interpretations of it, which sees these "services" as embedded within cultural practices that aim at and have consequences for achieving things beyond staying warm. The implication of a full integration of a social scientific understanding of these services would include seeing the maintenance of thermal comfort at home, including both the things people wear at home and things people do to heat their homes and keep themselves warm, as not just about staying warm, but also as implicated in social judgments around "properly" maintaining a home, and being a 'competent' adult/parent/spouse. This understanding of home heating activities would see them as important in maintaining social relations as well as personal identities and would acknowledge the importance of stigma (Hards, 2013; Hitchings and Day, 2011) around failing to observe various norms on how one maintains one's home.

In this sense many studies do not engage with how the activities and ways of being that signify energy poverty, as well as responses to it, are motivated by other imperatives than managing the cold in the everyday lives of those who might be struggling with it. Some, like Wright (2004) even go as far as suggesting that "cultural" heating practices like keeping the bedroom colder than other parts of the house among older people is a case of persistent old-fashioned attitudes that must be "addressed" through "health promotion initiatives" (p. 502). Absent from studies of energy poverty is, then, an engagement

with energy consuming household practices that scrutinizes them in context, and explores what they mean beyond supplying an energy service. One notable exception is Day and Hitchings' (2011) study of older people's winter warmth practices in the UK, which recasts policies aimed at addressing energy poverty among older people as part of a discourse that pathologizes aging and argues that often in their rejection of these recommendations (like wearing hats in bed), older people are motivated by concerns beyond the imperative to keep warm, and are rather engaged in the active management of older age identity and avoiding social stigma.

Middlemiss and Gillard's recent work (2015) on energy vulnerability offers an avenue for exploring energy poverty with an eye to how the normative discourses of vulnerability and poverty play out against the concerns and understandings of those who are said to be experiencing them. Their vulnerability framework makes an explicit point of focusing on households understandings of their own vulnerability. To this end, Middlemiss and Gillard use a vulnerability framework with roots in Nursing that attempts to offer an 'emic' understanding of vulnerability that define it as understood by the person or community considered to be vulnerable. Energy vulnerability/poverty, as understood in this "bottom-up" way, foregrounds the experiences of households, emphasizes their adaptive capacity and resilience, and has the potential for taking account of how energy use is implicated in things beyond meeting material needs. However, critiques of vulnerability approaches, especially around their ability to take account of structural processes that produce vulnerability apply here as well. In fact Middlemiss and Gillard acknowledge the limitations of this framework:

> Incorporating bottom-up understandings of vulnerability could mask political attempts to disengage from a fair and reasonable treatment of vulnerable people. Households' interpretations of their own vulnerability are dependent on their understanding of what is socially acceptable. As such, bottom-up interpretations may underestimate structurally produced vulnerability due to high levels of perceived and actual coping capacity among individuals and communities even in straightened circumstances. (p.148)

This inability to take account of how energy poverty is produced remains a key critique of the stream of energy poverty research that focuses on the experiences of people with precarious energy access. Furthermore, by reformulating energy poverty in terms of vulnerability, rather than inequality, certain parts of this stream might be reinforcing the marginalization of those who suffer the consequences of

systemic injustice.

These two parallel streams of energy poverty research are of course both important in developing nuanced understandings of energy poverty, both in terms of how it is produced and how it is experienced. However, they delineate a space for experience (i.e. the home) and a space for politics (i.e. governance), which is arbitrary at best. A robust conversation between the two approaches, therefore, can certainly advance the field in new and productive directions, one of which, I hope, will be the dissolution of this arbitrary delineation between the spaces of experience and politics. Households experiences of energy poverty matter, of course, not just as a way of "grounding" the analytically produced categories of 'poverty', 'vulnerability' and 'precarious energy access', but because I take as axiomatic that what is done in the private spaces of the home as deeply political acts. The processes that produce energy poverty, whatever they are, continue to perform their productions in the home —it, therefore, seems curious that accounts of household experiences would be devoid of politics. So I ask, in this thesis, what would an account of household experiences that is serious about the political nature of the practices of home keeping look like? Of course this is nothing new: feminist scholars have long done this with regards to gendered labour in the home, revealing the imprint of a patriarchal social order presence in the most intimate and mundane moments of everyday life. I merely aim to follow suit, pursuing the politics of energy production and distribution into the practices of mundane everyday life.

A corollary pursuit to that of taking "politics into the experience" is the taking of experience into the realm of politics. The literature that concerns itself with household experiences of energy poverty maintains that these experiences have important implications for how policy is designed. A conversation between these two streams of research can certainly make these implications explicit rather than merely hint at their existence. This thesis is very much concerned with creating such dialogue. Throughout this dissertation I engage with questions of how household accounts of their experience of energy vulnerability might change how we think about what vulnerability is in the first place and the ways in which it is addressed. However, what is needed is a framework within which these two parallel streams can engage with one another productively. My task in the remainder of this chapter is fleshing out what this framework might look like.

2.1 (Environmental) justice

One framework, which may be used to productively put the two streams of research on energy poverty in conversation is a justice framework. Fuel poverty has, in fact, already been discussed as an environmental justice problem (see Boardman et al., 1999, for example) —Walker and Day's (2012) paper, explicitly discusses how fuel poverty might be situated within a justice framework and Sovacool et al (2015) situate energy poverty in the emerging field of energy justice. Before I delve into the details of how a justice framework might be used to discuss energy poverty, I want to outline some basic tenets of an (environmental) justice framework, as well as my motivations for using it.

Firstly, I want to elaborate on the brackets I place around 'environmental.' Energy poverty certainly falls within the remit of environmental justice as an activist, policy and academic pursuit broadly concerned with the intersection of issues of environment and social difference. Inequalities in access to environmental resources has been a classic interest of environmental justice scholarship — and though energy access is less commonly talked about in environmental justice terms, it certainly can be thought of as a problem of unequal distribution of access to services or resources as Boardman et al (1999) argue. Furthermore, the distribution of burdens associated with the production and consumption of energy are increasingly the subject of work on climate justice, particularly focusing on the disparities in climate impacts between the global north and south. Moreover, there are important connections to be made between these two discussions with regards to the ways in which access inequalities will be exacerbated by carbon pricing policies that aim at curbing greenhouse gas emissions.

Despite the many connections between energy poverty and environmental justice scholarships, I put 'environmental' in brackets, mainly because the diversity of theoretical and methodological approaches that constitute environmental justice scholarship do not offer a concrete framework for the analysis of environmental inequalities. Since its birth in the US in the 1980's as a political movement, the environmental justice literature has grown to cover a diverse range of topics from the intersection of race, poverty and the distribution of waste sites in US to the global flow of e-waste and toxins (Pellow, 2007). The field embraces numerous theoretical frameworks, as well as methodological approaches that cover various techniques both within qualitative and quantitative methods. Indeed, much of the literature on environmental justice is dedicated to documenting the existence of environmental inequalities along race and class lines (Ringquist, 2005; Szasz and Meuser, 1997; Evans and Kantrowitz, 2003; Brown,

1995). However, this literature remains contentious quite often because there is no clear sense of what is to be done about the environmental inequalities that it documents (Mohai et al., 2009).This diverse body of literature contributes many insights to understanding environmental inequalities, but despite developing sophisticated critiques of itself (see Pulido, 1996, for an example on environmental racism), it does not readily offer a critical frameworks for the evaluation of the evidence that is brought to bear on making claims of environmental (in)justice (Walker, 2012). In fact, as Pellow and Brulle (2005) argue the breadth of the material covered under the environmental justice banner has grown so vast that it's hard to ascribe any analytical power to it (see also Getches and Pellow, 2002).

Of course, what gets covered under 'environmental justice' only matters in the context of what one hopes to accomplish by amassing a body of literature called environmental justice. If the goal is to develop analytical and theoretical tools for understanding how environmental inequities come to be, perhaps, the recommendations of Pellow and colleagues for restricting the definition of environmental justice has merit. If the goal is movement building, perhaps, the case Schlosberg (2007) makes for keeping the definition broad is more persuasive. My interest, here, however, is not weighing in on what environmental justice should cover, but rather to point out that the environmental justice literature is broad and interdisciplinary and doesn't offer a singular coherent analytical framework for the analysis of and theorizing about environmental inequities. When discussions of broad frameworks take place within the environmental justice literature, in fact, it is justice frameworks that are discussed (see Schlosberg, 2007; Walker, 2012, for example).

In building my framework for the analysis of energy poverty, I, too, therefore, start with theories of justice and will bring in the environmental justice literature to add complexity to the discussions. Environmental justice literature, in my view, has much to add to the theoretical discussion of justice, especially with regards to complicating ideal notions of justice as a thing that should be, with justice struggles that have to account for what is and how it comes to be so. Furthermore, I take inspiration from environmental justice literature in exploring different facets of an environmental justice problem at different analytical levels of individual, household and community. I will also use Walker's (2012) framework for making and evaluating environmental justice claims, noting, however, that much of what I do with it is using it as a framework for making justice claims.

But why cast energy poverty as a justice (or environmental justice) problem, at all? As I have mentioned, already, a justice framework has a pragmatic appeal for putting the two streams of energy

poverty research in conversation with one another. For me, a justice framework enables this conversation by virtue of the fact that when a justice claim is made a space is opened in which both the experience of injustice can be detailed (stream 1) and the mechanism for its production can be addressed (stream 2). In other words, an appeal to justice presumes a politics of care — caring about the experience of it, and caring about addressing it. More fundamentally, to talk of justice, Iris Marion Young argues, is to acknowledge mutual political responsibility:

> To invoke the language of justice and injustice is to make a claim, a claim that we together have obligations of certain sorts to one another. Many listening to the claim will disagree about precisely what those obligations are or how they should be met, but as long as we are arguing about what is just in this situation we are acknowledging we are together politically and owe at least minimal commitments of solidarity to one another. (Young, 1998, p.40)

As Young explains, multiple notions of justice might be present in any invocation of 'justice.' Making a justice claim, therefore, need not and does not presuppose an agreed upon notion of what social or environmental justice ought to entail, rather it espouses a politics of togetherness, an acknowledgement of a mutual implicateness in one another's lives. This political togetherness demands a "minimal commitments of solidarity", or if we wish to be more ambitious, a sense of responsibility for each other (it also demands a 'we', or a community of justice, but I'll come to that later). The exact shape of that responsibility depends on the specific notion of justice invoked, but this vague notion of responsibility is at the heart of my invocations of justice. So, to say that energy poverty is a matter of justice, is to say that we care about the experience of it, we care about addressing it, and in fact, we have a responsibility to each other to identify and remove the processes that create it.

2.2 What we talk about when we talk about justice

"but we're all human, I thought, wondering what I meant."

At the heart of many theories of justice is an appeal to something transcendental. For liberal humanists, it's often some essence of humanity or some notion of human rights. For many who seek justice because their deviations from allegedly universal norms have been used to devalue them and deem them less than human, though, this appeal to humanity is often followed by an instant pull away from that appeal, inviting the question of what that humanity means. I quote Ralph Ellison's invisible man, be-

cause it gets at that tension of appealing to a transcendental sameness and the simultaneous recognition of immense difference — the very tension that is at the heart of much of justice literature.

Many justice theorists have grappled with this tension: Some have suggested different transcendental notions instead of the old 'universal' ones (similarities rather than samenesses) (Harvey, 1996). Others have pointed out that any transcendental notion hides power relations (Young, 2011) and that deconstruction would reveal all essentialist notions as socially and performatively constructed. Others, still, have argued that deconstructionist views that contend themselves with deconstruction as justice render political mobilization impossible and that 'strategic essentialism' may indeed be necessary for movement building (Spivak, 1998). And some have attempted to offer transcendental notions that remain attentive to politics of difference (Fraser, 1989; Young, 2011).

My own notion of the transcendental is akin to feminist justice theorists' such as Young (2011; 2013) and to a lesser extent Fraser (1989; 1997). Fraser's transcendental concept is an "ethic of solidarity," while Young's emphasizes making explicit the normative concepts in appeals to justice and the necessity of deconstructing these notions to show their oppressive qualities. This kind of approach to justice locates its normative power in dialogue itself. As the quote at the end of the last section would suggest, this approach envisions all political claims as contingent, always contested and inherently imperfect. Young then goes on to construct a 'we' composed of "heterogenous and decentered" individuals, together (in the loosest possible sense of the word) and with responsibilities to one another, including an "openness to unassimilated otherness" (Young, 2011, p.227). This politics of togetherness, as Young explains, rests not on the similarities of the 'we', but its 'togetherness', in the sense that we are all impacted (but not similarly so) when the price of oil goes up, for example (Young, 1998). Layering Harvey's (1996) dialectic and Massey's (2005) similar relational social/spatial ontologies onto this heterogenous 'we' would render individuals as situated within multiple chains or trajectories, constituted by their social relations to others within intersecting chains of social practices — be it the chains of social practices that coalesce around food production, distribution and consumption or the intimate practices and relationships of parenting. Justice in this sense, is being politically responsible to the multiple beings that one is together with.

As I mentioned at the beginning of this section, however, to frame energy poverty as a justice problem, does not require agreement on any definition of justice. What it requires is an acknowledgment of the practical necessity of a working concept of justice (Harvey, 1996) as well as a recognition of the

fact that an appeal to justice is the beginning of a political conversation which rests on a politics of togetherness and responsibility for care and respect (Young, 1998) .

2.2.1 Distributive and recognition-based notions of justice

Starting with this understanding of what an appeal to justice entails, we must face the question of how injustice occurs. Most fundamentally, injustice occurs when this responsibility for care and respect is abnegated or ignored. This idea is encapsulated in discussions of justice in terms of recognition (Fraser, 1997). These discussions of justice as recognition contrast with more classic liberal discussions of justice over the primacy afforded to recognition versus distribution as central tenants of justice. Liberal theorists of justice frame justice as primarily a matter of the distribution of social goods (and bads). Rawls (Rawls, 1971), for example, sees justice as a project of determining principles by which a fair distribution of 'social advantages' can be achieved. He does this by way of thought experiments that involve a suspension of the knowledge of one's position in society and the privileges associated with or denied to that position. This 'original place' behind the 'veil of ignorance', Rawls believes, would allow the development of a fair process for the distributions of social goods— a process that he argues "everyone" can agree with.

However, those who argue against a purely distributive understanding of justice contend that the reality of oppression and injustice must be taken as the starting place for discussions of justice. The fact is, they argue, that the world is unfair, and there is no original place of retreat. Some people in this unfair world are not afforded the same respect and recognition as others. To do justice, in practice (as opposed to in thought experiments), therefore, necessitates taking account of the processes that have led to and continue to lead to unfair distribution of social goods and bads. A lack of recognition (of social difference) and acknowledgement of processes that privilege some groups over others is at the heart of oppression and injustice, Young (2011) argues, and the tackling of institutionalized oppression must therefore be the central concern of justice projects. Fraser likewise focuses on the context of oppression and misrecognition, arguing that misrecognition is a form of cultural injustice and domination (1998) which not only creates a devaluation and disrespect of individuals and communities but ultimately impacts the distribution of social goods, particularly through its effects on limiting the ways in which oppressed individuals and communities participate in political life.

Fraser's stance on misrecognition casts it as an institutional practice and structural phenomenon

which creates oppression through practices of cultural domination, nonrecognition and rendering invisible, as well as disrespect in cultural representation (Fraser, 1997). Fraser considers these kinds of symbolic and cultural injustice to operate alongside economic oppression (subject of distributive notions of justice) as institutional practice. Others, such as Charles Taylor (1992) and Axel Honneth (1992), on the other hand, frame misrecognition as an individual psychological experience rather than a primarily structural one (though Taylor's individual is a fundamentally a social individual). They contend that misrecognition primarily affect individuals' understanding of the self and is injustice in so far as it affect their self-realization.

The Fraser-Honeth debate (see Fraser and Honneth, 2003), of course, covers more than the question of how misrecognition affects individuals, but Fraser contends that much of their difference (which is actually around whether a recognition-based notion of justice requires a distributive parallel) comes down to how Honneth foreground self-realization and identity formation. However with regards to how oppression works, as with most dichotomies, there are insights on both sides oppression works through disciplinary (in the Foucauldian sense of the word) techniques that are psychological and these techniques from the basis of many institutional practices. This is a fact that Fraser herself points out, suggesting that misrecognition is simultaneously individually experienced but institutionally constructed. There is, however, an important implication in understanding mirecognition as an institutional practice, and that is the requirement for the establishment of fair institutional practices and processes as part of projects of justice. This idea, in fact, has developed into a third conception of justice alongside notions of justice as distribution and recognition.

2.2.2 Procedural justice

Procedural justice is primarily about ensuring practices of the state (and the entities that now do what states used to do) are fair and inclusive. For many theorists of justice, procedural justice is, in fact, an arena where maldistribution and misrecognitions play out their their oppressions, preventing marginalized individuals from participating in social life. Distributional inequities (such as lack of access to childcare or the ability to take time off work due to precarious employment) and misrecognitions (such as being disrespected), for example, hamper participation in decision making processes, and a lack of participation in decision making processes and lack of voice in public discourse by marginalized groups further entrenches the status quo. So, while Young (2011) sees participation in democratic decision

making as both an element of and a condition of social justice, Fraser (1998) emphasizes the importance of a parity of participation' in these processes. In order for this participation parity to be achieved, Fraser argues that effects of both distributional inequities and misrecognitions must be simultaneously addressed (i.e. participants must be afforded the same moral respect and recognition and resources to enable participation in the face of existing inequities must be available).

Procedural justice is, then, concerned with the ability of different people to participate in decision making processes, including in defining policies and procedures that affect them. In this sense, procedural justice is about who is present at the decision making table, and what kind of influence they have in this process. Both with regards to who is present, and how much influence they have it is clear that existing inequalities both in access to resources and in lack of recognition play a part in shaping the ability to participate. On the other hand, without procedural justice and the participation of those affected by maldistribution and misrecognitions it is impossible to address both maldistribution and misrecognition. As such, procedural justice, whether seen a precondition of justice or as a mechanism for bringing about more just outcomes is but one part of a process of justice — one that is also committed to redistribution and addressing misrecognitions.

2.2.3 Critiques of recognition and questions of self-determination

There are numerous debates surrounding each of these concepts of justice. I will bring up these debates as they come up in specific discussions in the empirical chapters of this dissertation. But before moving onto constructing a framework for understanding energy poverty from these three concepts of justice, there is one debate I want to spend some time untangling: When discussing justice as recognition, I glossed over what exactly is being recognized, and by whom. Indeed, much of the critical debate on the emancipatory potential of the recognition-based notion of justice hinges on the answer to these questions.

Taylor, Honneth, and Fraser, in their discussions of recognition, are primarily talking about recognition of collectivities of individuals by the state. Even when the question of justice for communities is concerned, many see it ultimately as justice for individuals within those groups. Of course, Taylor sees the basis of self-respect as rooted in membership in a cultural group and insists on protecting individual rights of group membership. Kymlica (1995), on the other hand, proposes group-specific rights. But ultimately, recognition, understood this way, is a relationship between the individual or groups of indi-

viduals and the state. Moreover, the state, in this arrangement, is seen both as an agent of justice and the entity that grants recognition. The elevation of the state to this position, in some ways, subverts the emancipatory potential of recognition as a form of justice, as states, often, grant recognition when and on terms that suits them.

Many critiques of this understanding of recognition and the liberal multiculturalism into which it develops in the context of minority and indigenous rights in Canada centre around the idea that the processes of recognition by the state are often the same ones that lead to misrecognition. Taking 'culture' as given, these understandings of recognition, in practice, often reify particular aspects of culture and produce essentialist accounts of what it is that they recognize. In this process, they present monolithic accounts of the category being recognized, often treating it as homogenous and unchanging and its creation (i.e. racialization), apolitical (see Abu-Laban, 2014, for example, for a discussion regarding Muslim minority rights in Canada). Recognition politics, in the context of the relationship between indigenous people and the Canadian state, has similarly resulted in the state recognizing cultural rights in ways that only allow for an apolitical view of culture — i.e. recognizing cultural practices that do not undermine the capitalist political economy of Canada (Coulthard, 2014b).

In this sense, not only does the state recognize only the aspects of indigenous cultures that it deems unthreatening to capital and its own sovereignty, but it does the recognizing on its own terms. For example, Paul Nadasdy (2005) examines the ways the Traditional Ecological Knowledge (TEK) is 'incorporated' in co-management practices in such a way that disregards indigenous assumptions about the nature of land and animals being managed. Elsewhere, he explains the terms of engagement in the comprehensive land claims process in the Yukon is fundamentally an imposition of the Euro-Candian relationships with the land:

> To even engage in the process of negotiating a land claim agreement, First Nation people must translate their complex reciprocal relationship with the land into the equally complex but very different language of "property." (Nadasdy, 2002, p.248).

Indeed, this translation of kinship relationships to those imposed by the Canadian state (of property and of capital) has also turned indigenous self-determination movements to ones that must formulate their demands in terms of 'territorial sovereignty' and, often, language of 'nation' and 'state', which scholars such as Nadasdy (2012) and Coulthard (2014a) point out as oppositional to indigenous forms

of governance, which among other things, reject exclusive claims to land as basis of nationshood[1]. Glen Coulthard (2014b; 2014a), examining the self-determination movements of the Dene peoples of the Northwest Territories during the 1970s and 80s, in fact, argues that these co-optations of indigenous self-determination movements to ones that reformulate their demands for the land in materialist terms rather than the land as a set of relationships are indeed products of the politics of recognition by the state. Coulthard, then, rejects the politics of recognition that lead to the pursuit of statist sovereignty as fundamentally incapable of accommodating relational understandings of the land.

Likewise, Alfred (2009) considers delegated forms of authority such as 'self-government' within the context of state sovereignty inappropriate for indigenous nations on the grounds that it reinforces the state, and statist notions of sovereignty which rely on mechanisms such as coercive force, control of territory and international recognition. Alfred sees these inconsistent with indigenous nationhood which rejects coercive enforcement of decisions and hierarchy (pp.77-81). Audra Simpson (2014), similarly notes the limitations of liberal recognition-based politics in engaging indigenous nationhood, but goes on to suggests that indigenous nations live within multiple nested sovereignties, which includes indigenous sovereignty (as a relational politic) over their territories within a sovereign settler state. Neither sovereignty, in this context, negates the other, though there are immense tensions in their co-existence. Simpson situates indigenous sovereignty (more specifically sovereignty as exercised by Mohawks of Kahnaw:ke) in everyday practices that refuse to engage with Canadian or American notions of citizenship.

In negotiating multiple sovereignties, Post Colonial scholar, Kevin Bruyneel (2007) argues, indigenous nations fight for a 'third space of sovereignty' neither inside or outside of the state. In doing so they reject the binaries of assimilation or independence set out by colonial states. Scholars such as Duane Champagne (Champagne, 2005) suggest that a meaningful accommodation indigenous cultures, institutional arrangements, governing bodies and relationships with the land can be made with the creation of 'multinational nation-state' which recognizes and incorporates various communities and nations that compose the national community. John Borrows Borrows (2002) engages with this question from a legal perspective, suggesting the adoption of legal pluralism and mutual recognitions that not only seek the

[1] As Nadasdy (2012) points out about the neat territorial delineations of First Nation land claims, "Land claim and self-government agreements are not simply formalizing jurisdictional boundaries among pre-existing First Nation polities; they are mechanisms for creating the legal and administrative systems that bring those polities into being. In fact, the agreements, conceived and written as they are in the language of state sovereignty, are premised on the assumption that First Nation governments must be discrete politico-territorial entities if they are to qualify as governments at all (p. 503)"

recognition of indigenous legal traditions by the state, but seek to fundamentally transform Canadian legal traditions.

As this brief discussion reveals while many indigenous scholars agree over the limited gains made available to indigenous communities within the framework of recognition politics, there are a range of critical responses on the question of how to transform these relationships to more just ones, ranging from a return to understandings of mutual recognition and nationhoods acknowledged in historical treaties with settler governments (Chiefs of Ontario; Idle No More) to acts of refusal of state recognition (Simpson, 2014) and its explicit rejection (Coulthard, 2014b,a). While the former often operates within rights-based frameworks made available through international fora as well as national enquiries that seek to transform relationships between various indigenous nations and the state, the latter often engage in acts of self-recognition. Indeed, many grassroots movements increasingly seek to cultivate the kinds of non-domination de-colonial relationships that they advocate. They do this in an embodied way, amongst other likeminded individuals, even as they organize around seeking strategic state recognition. Much of the indigenous organizing in the Downtown Eastside of Vancouver[2] or re-occupation of the lands in BC by indigenous families in camps set up to fight the extractive energy industry (among other things)[3] is based on practicing these alternative politics of self-recognition among group members and the publics as they engage with the group.

These forms of recognition and self-recognition, as exercised between individuals who share political responsibilities to one another, are indeed seen as resting on a wholly different notion of recognition. Jakeet Singh (2014) classifying these as 'recognition from below' (as opposed to recognition politics in relation to the state), suggests:

> Rather than beginning with a normative understanding of recognition as an institutional goal to be demanded or fought *for* by appealing to a single normative good, this orientation begins with an ontological understanding of recognition as something to be struggled *over*

[2]The Oppenheimer Park occupation, for example, served the city of Vancouver with an eviction notice in 2014 in response to the city's eviction notice to the homeless people who had camped in the park, reasserting the local First Nations jurisdiction over the lands that are city of Vancouver

[3]The Unist'ot'en camp, for example, is an occupation of their traditional territory by the Unist'ot'en family of the Wet'suwet'en nation, where they practice a protocol of free prior and informed consent at the entrance to the territory, rejecting the granting of access to extractive capital by the state, and insisting on their own right to give and refuse consent. Other camps, such as the Madii Lii camp on the Madii Lii territory on the lands of the Gitxsan nation, the Lax U'u'la camp on the territory of Sm'ogyet Yahaan on the lands of the Lax Kw'alaams nation similarly embody resurgent indigenous sovereignty in their interruption of and challenge to the state's practices of 'resource' management and granting of access to these territories to the energy industry.

> in any social or political relation. Recognition, here, is primarily understood not as a right or a form of accommodation offered by, or demanded of, the state but, rather, as an irreducible dimension of all relations of power and governance. (emphasis in the original, p.50)

Indigenous self-determination movements organized around this rejection of state recognition and centring acts of self-recognition seeks to transform the relationship with the land, not in the materialist sense of the word, but rather land as a "system of reciprocal relations and obligations" (Coulthard, 2014a, p.13). For some, these alternative and embodied claims to sovereignty are necessarily anti-colonial as well as anti-capitalist and are committed to recentering kin-based and place-based relationships rooted in values of respect and reciprocity with the land, other species and nations (Simpson, 2011; Coulthard, 2014a; Corntassel, 2012). These thinkers consider capitalist relationships with the natural world as fundamentally incompatible with the relational and responsibility-based practices of many indigenous communities since they replace understanding of the land as a set of relationships and responsibilities with understandings of the land as resources for extraction (Coulthard, 2014a; Corntassel, 2012), pursuing the creation of wealth as an end to itself rather than the enhancement of families and communities' well-being which is the guiding principle of the traditional Nuu-chah-nulth way of life(Atleo, 2011, p.167).

These critiques stand in sharp contrast with approaches to indigenous sovereignty that not only accept capitalist economic frameworks, but indeed consider its adoption by indigenous nations as critical to the success of indigenous sovereignty projects by enabling economic self-sufficiency for these nations. Duane Champagne's 'tribal capitalism' (2004), Robert J. Miller's 'reservation capitalism' (2012), and David Newhouse's 'capitalism with a red face' (2000) are examples of conceptualizations of capitalism that are seen by some as consistent with indigenous worldviews. Nuu-chah-nulth scholar Clifford Atleo (2015) in his examination of what he calls 'aboriginal economic development' expresses scepticism about the consistency of these approaches with indigenous worldviews but acknowledges the significance of the practical necessity which drives their pursuit. Indeed he makes a distinction between "small entrepreneurial engagement with markets on [Nuu-chah-nulth] terms and industrial scale exploitation" (p. 158) of non-human relations. He goes on to suggest that smaller-scale engagement with markets can be made in ways that are consistent with the Nuu-cha-nulth principles of hishookish tsa'walk (everything is one) and iisaak (respect) by recognizing the interconnectedness of all things

and acting cautiously, and by respecting all human and non-human relations, for example by not taking more than the community requires when harvesting foods and doing everything possible to not endanger species recklessly.

For Leanne Simpson (2011) alternative political-economic arrangement involves "revitalization of sustainable local indigenous economies that benefit local people," organized around the Anishinaabe concept of mino bimaadiziwin (the good life/continuous rebirth), which sees the purpose of life as promoting more life. Simpson sees this translated into the economic realm as a "very localized economy where there [is] a tremendous amount of accountability and reciprocity" (Klein and Simpson, 2013). Glen Coulthard (2013; 2014a), drawing inspiration from the 1970s movements of the Dene Nation, suggests cooperatively owned enterprises and traditional and substance-based practices may be appropriate for some Nations, while applying indigenous governance principles to non-traditional economic enterprises to promote "sustainable economic decision-making" and the "equitable distribution of resources within and between Indigenous communities" (Coulthard, 2013).

As with the relationship with the state in the case of recognition politics, indigenous self-determination is conceptualized as involving different possible political-economic arrangements ranging from capitalism envisioned as consistent with indigenous worldviews to selective engagement with capitalist markets on indigenous terms and to explicitly anti-capitalist re-imaginings of collective and local economies, the latter cases presenting a serious challenge to political discussion that leave out questions of political economy.

2.2.4 Restorative justice

There is also a fourth dimension and understanding of justice, which is often left out of discussions of environmental justice - namely reparative or restorative justice. Perhaps because it overlaps with notions of Justice as the law, many environmental justice scholars shy away from including notions of reparative or restorative justice in their frameworks of environmental justice (note the absence in Walker, 2012; Schlosberg, 2007, for example). However, work on environmental injustice, whether it is the destruction of a community's home and environment or whether it is envisioned as adverse health effects suffered as a result of environmental pollution by some members of a community, compels us to consider corrective forms of justice. Discussions of what constitutes justice in the aftermath of environmental destruction are truly complicated, often involving litigation work, long settlement

processes between communities and the perpetrators of the environmental injustice or the state, and indeed much discussion within communities suffering from environmental injustices as to how best to mobilize and what would constitute justice for them. Much of this work is left to communities, lawyers and legal scholars (White, 2013; Preston, 2011, for example), as well as judicial bodies and tribunals both internationally and nationally that work on issues such as resettlement in the aftermath of environmental destruction.

Nonetheless, there is work for environmental justice researchers as part of the community conversations, for example, on characterizing the nature of loss suffered by community members, including loss of intangible things as well as documenting tangible health impacts, on eliciting what forms of reparative work community members would consider appropriate, or by translating losses to economic terms, where appropriate for monetary compensations.

There is also important work for environmental justice scholars in developing policy tools and solutions that address the more systemic dimension of environmental injustices — in fact, a common demand from those suffering injustice is the development of mechanisms such that no one else will have to suffer the forms of injustice they did. This work would begin by developing critical analyses of how environmental injustice occurs in the first place, and continue to developing policy reforms (while we organize and/or wait for the revolution) that might prevent future environmental injustices, as well as evaluating the efficacy of existing solutions in remediating different aspects of the particular injustice.

Indeed, one of the critiques of environmental justice literature as a whole is that it rarely engages with what is to be done about justice claims that it makes (Mohai et al., 2009). Engaging with reparative or restorative notions of justice, as complex an endeavour as it is, is an avenue through which environmental justice researchers can add an actionable element to their work. Certainly, it is never for researchers to suggest what justice might look like for a community — That is always for those affected to articulate. However, there is much assisting that environmental justice scholarship can offer during that process, as well as in policy evaluation and design for addressing environmental justice demands.

2.2.5 Concluding thoughts on (environmental) justice

I want to use this moment to draw attention to an entirely obvious, but so far uncommented on aspect of justice: Justice is time, place, and culture specific, if one subscribes to a contingent nature of power and politics. What is seen as a just arrangement in one time/place/culture (say the stoning of adul-

terers) might be seen as unjust (or 'barbaric', 'inhumane', or 'oppressive', depending on the cultural paradigm evaluating it) in other times/places/cultures. There are several implications to this statement. Firstly, and somewhat obviously, that to talk of justice in the abstract is to deny the contingency of the notions of justice on context-specific values and practices. In other words, what justice is in any given context will depend on values and worldviews of the people in that context. As the discussion on indigenous self-determination suggested, for indigenous nations to be sovereign and self-determined according to their own conceptualizations, they must be able to fulfil their obligations to their community members and their non-human kin according to their worldviews (Atleo, 2011; Coulthard, 2014a). This requires access to indigenous homelands and the ability to practice their own forms of decision making and governance, including and especially those that run counter to state-centric understanding of self-government, rejecting "control, exclusivity, domination and violence" (Simpson, 2011, p.62) in relationships with the land as well as other kin, both human and non-human. Work on (energy) justice in settler colonial contexts like Canada must, therefore, engage with the ways in which relationships with the land are commodified to create (energy) 'resources'.

Secondly, to talk of justice, to begin adjudicating what is just and unjust, requires a community of adjudicators. In other words, justice is contingent on the idea of community. To invoke the language of justice, then, is to appeal to a transcendental notion around which a transcendental community is formed. It is for this transcendental community — whether it's humanity', citizenship', a loosely together we' connected perhaps by nothing more than the fact that a change in price of oil affects us all, or some idea of kinship — to establish exactly what justice is in any given situation.

In this sense, the very concept of justice is a way of navigating between the individual and a community, albeit a different community than the communities that environmental justice movements demand justice for. The community that an appeal to justice creates is a contingent community composed of those who contend an injustice has occurred to them, and those who are deemed to be responsible (either directly, or through some notion of political togetherness) for rectifying this injustice. It may be uncomfortable for individuals to come together and form this contingent community, when some have enslaved some others, when some have perpetrated genocide on others, when some continually deny the others dignity and respect, but if there is to be an appeal to justice, we have to form a contingent we' so we can begin squabbling about what justice is.

In investigating energy access as a justice issue in the context of indigenous communities in British

Columbia this adjudicating community will invariably include First Nation communities as well as settler communities, who not only have political responsibilities to indigenous community members by virtue of togetherness, but also have specific responsibilities for the operation of their settler governments. I take it as axiomatic that it is the responsibility of settler scholars and practitioners (such as myself) to learn from indigenous scholars and practitioners and work on identifying the processes by which particular energy policy regimes create disempowering patterns of access for indigenous communities as well as differently disempowering patterns of access for marginalized settler communities.

This section (and more broadly this thesis) is written in this spirit of engagement and conversation. I've attempted to lay out some of the things we talk about when we talk about justice. I hope that I have been clear about where I stand on these ideas, but I want to reiterate that my readers, my research participants, and myself need not share an idea of justice — all that we need is an agreement on the fact that to frame issues of energy access (or any issue) as one of justice, is to make a claim that we together have obligations of certain sorts to one another (Young, 1998, p.40).

For analytical purposes, we also need an understanding of what a justice claim entails. Here, I use Walker's (2012) simple framework which outlines the components of an environmental justice claim. This framework sees a claim as composed of three elements: a) a description of an inequality, b) a discussion of why this inequality matters (how those who experience it are affected by it) and c) an analysis of how it has and/or continues to come about. To incorporate notions of reparative or restorative justice, I propose a fourth element to this framework, so that an environmental justice claim may be made actionable. This fourth dimension is a discussion of mechanisms by which it may be addressed. Armed with this framework and this discussion of some of the pertinent concepts of justice, I proceed to discuss how an environmental justice framework may be applied to energy poverty.

2.3 The opposite of (energy) poverty is (energy) justice

A number of recent publications have attempted to conceptualize energy justice as an area of research concerned with issues of justice around the generation and distribution of energy(Sovacool et al., 2016; Sovacool and Dworkin, 2015; Sovacool et al., 2017; Jenkins et al., 2016). Sovacool and Dworkin (2015) define energy justice as a field concerned with "a global energy system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial energy decision-making" (p.436). Suggesting that the field of energy studies would benefit from an engagement with

issues of social justice, Sovacool and colleagues (2016) attempted to reframe energy decisions as questions of justice and ethics and developed a framework for energy justice studies composed of discussions of the following elements: availability, affordability, due process, good governance, sustainability, intra as well as intergenerational equity and responsibility. They situate energy poverty as primarily involving questions of availability and affordability. Walker and Day's conceptualization of energy/fuel poverty (2012), however, highlights the ways in which energy poverty as injustice involves issues beyond those of distribution (availability and affordability) and include various other elements.

In this section, I aim to expand on the application of a justice and energy justice framework to understandings of energy poverty with the aim of both highlighting the practical matters of how one might do so, and the generative possibilities therein. I begin with Walker and Day's (2012) summary of conceptualizing energy poverty as injustice and proceed to unpack the various elements of it. Applying concepts of justice to problems of energy access and vulnerability, Walker and Day argue that while fuel poverty is primarily a matter of distributive (in)justice in terms of access to energy services, it can also be viewed as a matter of procedural and recognition-based justice:

> Addressing fuel poverty is [...] a matter of justice as recognition, in needing to recognise the differential rights and needs of vulnerable groups, and of procedural justice in terms of ensuring access to information, legal process, and effective influence in decision-making. (Walker and Day, 2012, p.73)

Certainly, as Walker and Day suggest a justice framework would allow a fuller engagement with energy poverty with regards to the ways in which it must be addressed, including the importance of having access to legal processes and decision-making fora. I would argue that a justice framework also has immense analytical potential for studies of energy poverty, particularly as it can serve as a framework within which the two streams of energy poverty research discussed earlier might be put in conversation.

One of the dividing lines between the two streams of energy poverty research that I've discussed so far is the space allocated (or not allocated) to the politics of energy poverty work - the question of how it comes to be and how it is implicated in other processes of marginalization. Adopting a justice framework has the potential for addressing the absence of these questions in studies of the experience of energy poverty, as a justice framework would require a description of inequalities, a discussion of why these inequalities are unjust and how they are produced and reproduced (Walker, 2012). Applied

to energy poverty, a justice framework would require a description of inequality in accessing energy services, a discussion of what implication the presence of these inequalities has on the lives of those experiencing them, as well as an analysis of the forces that bring them about and maintain them. While a description of the inequalities may well be constructed from within a technoeconomic understanding of energy poverty (for example taking consumption metrics as indicators), questions of how and why this inequality matters can not be addressed without engaging with household experiences, as the qualitative studies of energy poverty have attempted to do. Similarly, providing a description of how these inequalities come to be can not be done without stepping outside of household experience and investigating the commonalities of these experiences in terms of geography, regulatory regimes, socio-economic status, etc.

In this sense, a justice framework can help address a different divide in the two streams of energy poverty research, namely that of scale or unit of analysis. Environmental justice frameworks offer a flexibility of movement between the particulars of household-level experience and the more 'universals' of the experience of spatial, cultural, or administrative communities. As such, it can offer a space in which the two parallel streams of research on energy poverty, with their focus on household experiences and analysis of governance as applied to different "communities", can be put in conversation.

Furthermore, the different conceptions of justice, as Walker and Day (2012) demonstrated, contribute different nuances to each of the three elements of a justice framework. Specifically with regards to recognition-based justice, for example, Walker and Day discuss fuel poverty as injustice in terms of a lack of recognition of the differential needs of vulnerable groups for energy services. Examples of this include a misrecognition of the fact that people who are unemployed, people on disability, people who live in multigenerational homes and people who work from home spend more time at home and therefore have a need for heating that extends throughout more hours of the day than those who spend significant portions of the day away from home. Furthermore, they argue that some of these groups, due to existing health conditions, for example, might need higher temperatures in addition to longer hours of heating.

A recognition-based idea of justice also allows for acknowledging the culturally situated nature of household practices that use energy (Wilhite et al., 1996; Lutzenhiser, 1992; Erickson, 1987; Stephenson et al., 2010, for example,) and the ways in which participation in the life of a community, and the ways in which cultural and political respect is granted is contingent upon the successful performance of house-

hold maintenance activities. Earlier cultural studies of energy consuming activities in the home, for example, have revealed the importance of keeping the home warmer when expecting guests or preparing and keeping food warm in an oven prior to the arrival of guests in Swedish homes (Erickson, 1987). An inability to fulfil these cultural norms around entertaining guests may indeed have implications for how one participates in the social life of a community. Even more urgent still is the stigmatization endured by households whose experience of energy vulnerability intersects with other forms of poverty and its marginalizations, as I discuss in Chapter 4, particularly around issues of children's cleanliness and presentability at school. Indeed, an important contribution of a recognition-based understanding of justice to discussions of energy poverty and justice is enabling the investigation of the intertwined nature of energy injustice and other axes of marginalization such as those of class and race.

In addition to this issue of stigmatization a recognition-based idea of justice would allow an acknowledgment of the different consequences of being in energy poverty for different people. Numerous studies of energy poverty in UK and Ireland have noted a link between excess winter mortality among older adults and energy poverty. In the UK, for example, excess winter deaths were three times more common in the coldest quarter of the housing stock compared with the warmest (Wilkinson et al., 2001). Links between a number of physiological and psychological conditions and living in colder homes have also been suggested in a number of studies (see Liddell and Morris, 2010, for a review), especially so in the case of physiological development among children and infants (Frank et al., 2006; Howden-Chapman et al., 2008). These studies collectively suggest that the stakes are considerably higher for older adults and infants, and a recognition-based notion of justice would demand taking account of this fact in addressing energy poverty.

Furthermore, a procedural notion of justice applied to the problem of precarious energy access reveals important dimensions of the problem with regards to both how energy poverty might be addressed and how it is tied to larger questions of how energy provision decisions are made. With regards to the former, notions of procedural justice highlight the importance of access to information, legal recourse and access to more fair energy pricing schemes, particularly in de-regulated markets where those experiencing the most hardships are often subjected to the steepest rates via pay as you go schemes.

With regards to the latter, applying a procedural justice lens to the problem of energy access (by some) invites an examination of the processes of energy development that leave some groups of people out of their access granting structures and regulatory (or de-regulatory) regimes that increase the pre-

carity of access for some. Furthermore, the application of this notion of justice to understandings of energy poverty allows for the inclusion of discourses of community self-determination, both as it relates to the inclusion of 'those impacted' in decision making processes involved in energy development and it's application in indigenous communities as means of engaging in decolonizing projects that aim to address energy poverty as well as other colonial wrongs (Rezaei and Dowlatabadi, 2015).

The latter case, as wells critical responses to recognition-based notions of justice by indigenous scholars, also invite an examination of the extractive nature of many processes of energy generation and their entanglements, particularly when mobilized by centralized energy planning paradigms with colonial and capitalist projects that undermine indigenous self-determination practices. Resistance to these processes as well as alternative imaginings of energy production systems as seen by indigenous communities are, then, critical components of energy justice. In fact, Sovacool et al's recent piece (Sovacool et al., 2017) on energy justice identifies the two elements of resistance to unjust energy development and intersectionality (conceptualized as the entanglements of energy justice with issues of race, class and the treatment of non-human beings) as important elements missing from their previous (2016) energy justice framework.

With this broad understanding of how a justice and energy justice framework can a) complicate understandings of just what energy poverty is, how it manifests itself, and how it is produced and reproduced and b) allow for the various insights in the two streams of energy poverty research to engage with one another and therefore offer a cohesive (to the extent that that is even desirable) framework for the analysis of energy poverty, I turn to the practical problem of just how such a framework can be mobilized in a study of energy poverty.

2.4 A relational social practice — or notes on how various pieces of this thesis fit together

I began this project by asking a rather broad question that took as given the existence of a discursive and material category of experience known as energy or fuel poverty. I wondered what this experience looked like, how it was felt by those who were said to be experiencing it, and how some of the hardship associated with it might be alleviated. Thus I began an exploration of what the literature said energy poverty was, and what the people who according to this literature were experiencing it around me were saying about it (this around me was initially conceived of as Canada, but later became more

specifically two communities in British Columbia). The entanglements of the thing which the literature broadly defined as the inability to meet ones energy needs with issues of justice, and in the case of the communities that became my case studies, colonialism became evident to me in these conversations. But to start these conversations, I had to locate sites of manifestation of this experience in people's daily lives, in how they used energy at home (though I was open to other places of its emergence). An obvious place to start was looking at studies of household energy behaviour and its subsequent critiques.

There is certainly a tradition of energy research that studies 'energy behaviour' using consumption metrics. This lineage of research, for example, has historically investigated energy consumption (which it takes as a metric for behaviour) as a function of changes in energy metering schemes (Hackett and Lutzenhiser, 1991; Carlsson-Kanyama et al., 2005), access to different sources of energy conservation information (Craig and McCann, 1978), and metrics of pro-environmental behaviour (Becker et al., 1981; Heberlein and Warriner, 1983; Linz and Heberlein, 1984). This predominantly quantitative literature is content with establishing links between various factors and how much energy households use, forgoing descriptions of the ways in which these various factors affect how people do things that use energy. In other words, much of this literature analyzes energy behaviour through the lens of consumption, as an aggregate whole that does not take account of the heterogeneity within the various activities that make up the aggregate. Furthermore, this almost monolithic consumption, is either taken as a proxy for behaviour (how energy is used) or more abstractedly, as an expression of intention, agency or some understanding of class or lifestyle (see Rezaei, 2013, for a more detailed review).

While taking consumption of energy as an indicator of how it is used in the home, and the consequences of having a hard time accessing it is clearly problematic for the reasons that I mentioned above, it may, nonetheless, be a good indicator of problems of access themselves. In fact, studies of energy poverty, following in the tradition of economics analyses of poverty, often use consumption metrics to identify households that may be shouldering disproportionate energy burdens. The earliest definitions of energy poverty, in fact, as I have already outlined, used a consumption indicator for identifying the problem of energy access. Focusing not on how much energy people use, but rather what percentage of their income goes towards paying for their energy needs, this class of definitions of energy poverty would enable developing a broad understanding of areas of gross inequality, be it demographic or geographic, and energy generation and regulation regimes that contribute to energy access problems for some. The following chapter in this dissertation, indeed, attempts to carry such an analysis of energy

access across Canada using consumption and expenditure-based data to provide an analysis of the broad structural factors that affect households' ability to access energy.

In pursuing the question of how energy is used in the home and what the consequences for its absence might be, next, I follow a parallel and competing lineage of research, which proposes a cultural model of understanding household energy use. Seeing material culture as made up of socially-regulated and culturally meaningful items, Lutzenshiser (1992) calls for a cultural analysis of the similarities and difference in energy use among various energy sub-groups, in terms of "similarities and differences in dwellings, vehicles, appliances, everyday routines, status understandings, technological knowledge, patterns and behaviour, and belief" (Lutzenhiser, 1992, p.56). An investigation of "energy cultures" (Stephenson et al., 2010) and sub-cultures, this literature argues, will shed light on the internal logics of each group around the use of energy and technology. This literature has produced cross-national studies of household energy use (Wilhite et al., 1996; Erickson, 1987), as well as studies that conceptualize cultural subgroups differently based on income, ethnicity (Maller, 2011), generational trends (Carlsson-Kanyama et al., 2005), or around different conceptions of the 'home' (Aune, 2007; Hallin, 1994).

This approach to understanding household energy use disengages from equating behaviour and consumption by exploring the way in which some energy-consuming practices are conducted within households. In this way, it begins to shift the focus of investigation from one that views consumption/behaviour as an outcome of various social or individual contextual variables and towards one that explores how households engage in activities that use energy. However, as the diverse range of conceptualization of "cultural subgroups" listed above would suggest, it doesn't quite manage to lose the notion that there are external factors albeit now grounded in 'culture' that not only affect, but somewhat determine how energy is used at home. Or put differently, energy use is now conceptualized to be expressive of some kind of culture.

There are other critiques of both the 'behavioural' and 'cultural' studies of energy use: The conception of the individual that acts with intention, as is implied in the language of 'decision making' and 'expression' both in cultural and behavioural studies, for example, neglects the role of habit and incidental and inconspicuous energy use. Furthermore, the focus on the individual, itself, in these studies has been extensively criticized on the basis of its exclusion of family negotiation processes, household dynamics, and institutional arrangements (Carlsson-Kanyama and Lindén, 2007; Gladhart and Roosa, 1982; Grønhøj, 2006; Hinchliffe, 1996; Judkins and Presser, 2008). Critiques of the political impli-

cations of the focus on individual in both energy studies and energy policy have, however, been less common. Though, analyzing the energy efficiency discourse, Gyberg and Palm (2009) identify 'individual choice' as a strong theme, one that they link to the use of information as part of the movement towards deregulation and privatization of service provision and neoliberal approaches to governance. "The battle for the future energy systems", they argue, "is in this sense made a consumer-oriented issue and it is the consumer who is expected to make the defining decisions leading to sustainability" (p. 2810). The consumer (whether it is conceptualized as an individual or a household, or an organization, for that matter) is, then, responsible through the act of consumption, something that much of the literature on the subject conceptualizes as intentional as well as symbolic and expressive.

However, as I have suggested already, energy consumption in the aggregate household level, represents different forms of consumption tied to various activities, each of which may be understood in different terms, governed by different logics and (if we insist on staying tied to some notion of expression) express different things. Focusing on the act of consumption or the individual consumer, therefore, treats both as homogenous and yields a limited understanding of energy use in households. Furthermore, there are several aspects of energy', itself, as a material/energetic thing, with its own lively' properties, which presents an ontological challenge to these conceptualization of it as something that is used in the house similar to other commodities . For example, consumptions of many commodities whether consumption is defined as the moment of purchase or use —can often be traced to a single, often intentional moment. Energy use, on the other hand, is firstly, embedded within habits, routines and rituals — such as washing of dishes and opening of windows — that may not be seen as moments of energy consumption by those who partake in them. More importantly, energy use, even when intentional, is mediated by thermodynamic processes, technologies and material that by virtue of their thermal efficiencies or insulation properties affect the amount of energy consumed in achieving any given level of service. Hot air rises, phantom loads drain power and in all this, it's not just the agency of the individual doing the using, but also the agency of the material and energetic arrangements of daily lives and that of the social and governmental organizations that are implicated in how much of a thing is consumed.

2.5 Social practice theory

In an attempt to bridge the dualities and dichotomies of habit and intention, action and structure, and individual and social and following the practice turn (Reckwitz, 2002; Schatzki et al., 2001) in social

theory, studies of household energy use are more and more drawing on theories of practice in their investigations of energy consuming activities, or practices. Practice theory, as a form of social theory, stands opposed to both purpose-oriented (rational choice) and norm-oriented theories of action (Reckwitz, 2002), by focusing on practices as mediating concepts between individual choice and social norms and structures. Practice theory has a rather diverse theoretical origin, but Bourdieu's work and Giddens' theory of structuration, and more recently Thoedore Schatzki's work are seminal in charting a path and developing a social philosophy focused on the concept of practice.

Distinguishing between practice as a coordinated entity and practice as a performance, Schatzki (1996), defines the first as a "temporally unfolding and spatially dispersed nexus of doings and sayings." These doings and sayings are linked in several ways: through understandings (of what to say and do, for example), through explicit rules of engagement, and through what Schatzki refers to as ""teleoaffective" structures embracing ends, projects, tasks, purposes, beliefs, emotions and moods" (pg. 89). Practice as a performance, in contrast, is a specific enactment of practice as a coordinated entity. Alternatively, Reckwitz (2002) defines practice as a

> routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge (p. 249)

Both definitions highlight elements of temporality (routinezed, temporally-unfolding), action (bodily activities, doings), and understandings and competence (understandings of what to say and do, rules, know-how, background knowledge). Reckwitz' definition emphasizes the role of material and artefacts (things and their use), a view that is less explicitly incorporated in Schatzki's view of practices, which are seen to be composed of "embodied, materially mediated arrays, and shared meanings" (Schatzki et al., 2001, p.3). In fact, Schatzki's later work (2010), brackets material arrangements' out of practices and talks of practice-arrangement bundles that constitute social life. Shove and Pantzar (2005) see practices as the "active integration of materials, meanings and forms of competence" (p.45), created and recreated by practitioners as well as the producers of the materials and technologies that are involved in these practices. I will return to the exact treatment that the material world receives in social practice theoretical accounts later in this chapter and in more details in Chapter 3, but regardless of differences in how

material arrangements are incorporated in understandings of practice, the most significant theoretical insight of this body of work is seeing energy-consuming practices — encompassing the varied and routinized performances, practitioners enacting these performances, energy generation infrastructure and energy-consuming technologies — as the primary objects of study. In other words, practices (or practice-arrangement bundles) become the site of the social and the basic ontological units for analysis (Schatzki, 2002).

Extending this particular view of practice as the basic ontological unit of analysis to discussions of consumption, Alan Warde (2005) argues that consumption (but not shopping, which is a practice in itself) occurs as a consequence of engagement in practices, and must be understood as a moment in every practice while not being an integrated practice in itself. The argument is similar to those made above with regards to inconspicuous, unintentional and habitual energy consumption, emphasizing the observation that people partaking in activities that consume energy rarely see themselves in the act of consumption, but rather as cooking, driving or heating their homes:

> From the point of view of a theory of practice, consumption occurs within and for the sake of practices. Items consumed are put to use in the course of engaging in particular practices like motoring and being a competent practitioner requires appropriate consumption of goods and services. (p. 145)

I would argue that this view of consumption is particularly suited to understanding the consumption of services like the ones that energy provides, allowing for the opportunity to focus on disaggregating household consumption to its constituents.

Another implication of this view of consumption, however, is that 'wants' and 'needs' are created by practices, rather than individual desires, be it utilitarian or expressive. Warde (2005), again, argues: "it is the fact of engagement in the practice, rather than any personal decision about a course of conduct that explains the nature and process of consumption (p. 138). This view is in some ways quite consistent with an "energy services" understanding of household energy use which has long advocated for reorganizing household energy markets around selling access to the things that energy enables rather than quantities of energy used in gaining access to those things. Rooted in more techno-economic approaches to energy studies, the argument put forward by advocates of the energy services paradigm has been centred on possible efficiency gains from reorganizing energy markets such that households are sold hot water, for

example, rather than natural gas which they might use for heating water, thereby requiring the seller to arrange for the most efficient mechanism for heating water. These technical accounts, of course, take for granted the need for hot water, where practice theoretical accounts push beyond this taken-for-grantedness and query where that need comes from. Of course, the bed-rock of SPT is the notion of practice (or practice-arrangement bundle, or some notion of practical knowledge), which give rise to all notions of needs or wants.

What role does individual agency/desire, then, play in differential engagement in practices? Theories of practice view the individual, not just as an agent or a carrier of practices, but rather in his/her engagement in varying social practices, the individual becomes "the unique crossing point of practices, of bodily-mental routines" (Reckwitz, 2002, p. 256). Ropke (2009) comments on the "strong element of path dependency in daily life", arguing that engagement in different practices throughout one's life alters the mind and the body of the individual, preparing them for participating in some practices while excluding others (p. 2493). The individual, here, enacts his/her agency and intention in developing the skills and capabilities required for engagement in particular practices. More importantly, though, theories of practice offer

> a distinctive perspective, attending less to individual choices and more to the collective development of modes of appropriate conduct in everyday life. The analytic focus shifts from the insatiable wants of the human animal to the instituted conventions of collective culture, from personal expression to social competence, from mildly constrained choice to disciplined participation (Warde, 2005, p. 146).

By shifting the analytical gaze to the social development of modes of appropriate conduct, a practice theory approach to studying energy use allows capturing generational changes in habits and routines, notions of thermal comfort, and expectations around appropriate behaviour, such as levels of cleanliness and convenience.

The social practice approach to understanding energy use and demand, therefore, insists on beginning not with energy itself, but rather what energy is for (Shove and Walker, 2014). To this end, Elizabeth Shove's (2003) *Comfort, Cleanliness, and Convenience*, for example, engages with documenting the co-evolution of notions of comfort, cleanliness and convenience and everyday household practices such as heating and bathing.

Complementing studies that trace these trajectories of development for different practices, are studies that investigate the varied ways in which energy-consuming practices are enacted in households and the roles they fulfill. Rather than presenting a homogeneous and stable view of household practices, for example, Hand and Shove (2007) highlight the ways in which ordinary household appliances such as freezers, and associated household practices like freezing, fulfill an elastic role in many different household regimes, from those who go to extreme lengths to consume locally grown foods to those that use freezers primarily as means of creating convenience around food preparation. Shove and Pantzar's (2005) work on the invention and reinvention of Nordic walking in different contexts, likewise, emphasizes the piecing together of the various elements of a practice in new and locally-situated ways to constitute practices. In this sense, individual and local performances of a practice are not only important sites for the continued reproduction of a practice, but also the integration of new skills, materials or understandings into a practice.

Practices, in this view, are integrated entities that are constantly being reproduced, reinterpreted and innovated upon, yet remain remarkably consistent for long durations of time, recognizably involving similar things, understandings and achieving similar objectives. Taken as the primary unit of analysis, they can therefore reveal the persistent make up of social life, including notions of appropriate modes of conduct, and desired levels of qualities like cleanliness, comfort, convenience, mobility, privacy, security, freedom, etc. For the purposes of studying energy poverty and its manifestations in the home, taking practices as the central object of study offers the opportunity to not only grapple with the details of how people are impacted by precarious energy access, but to also query what are considered normal degrees of achievement in the above mentioned qualities of comfort, cleanliness, etc.

Using a practice theoretical approach that asks not about energy itself, but how people do household tasks that require energy can therefore generate rich descriptions of how household practices that use energy are carried out, how they are modified in case of challenges in energy access, as well as highlighting places of compromise in the achievement of norms which might not be anticipated by the researcher purely investigating energy use, and as such would allow for a certain degree of emergence in terms of what the experience of energy poverty is thought to be.

However, the emerging field of practice-theoretical studies of energy use has also produced work that uses the language of practice to explain differences between people's energy consumption (Gram-Hanssen, 2011, for example) or attempt to recast pro-environmental behaviour change in practice terms

(Hargreaves, 2011b). Shove and Walker (2014) see these studies as practice language layered on top of projects that are behaviourist at the core. Certainly, these studies are not devoted to studying 'practices' as the central object of study. But it is also important to ask what can be revealed when practices are taken as the central object of study, beyond what I referred to earlier as the persistent make up of social life and notions of appropriate conduct.

What I am hoping to address in raising this question is the issue of where the analytical power of practice theory might lie, particularly with regards to studies of household energy use. Certainly, as I have argued so far, practice theoretical approaches in studies of household energy use have the advantage of allowing for disaggregating the previously-monolithic energy consumption into the various practices that it is composed of, and revealing the internal logics of each of these practices. This insight, however, can certainly be applied to the studies that attempt to explain patterns of group or individual behaviour as methodological innovations that do not interrupt the analytic paradigm, as the studies cited above have done, or work such as Sarah Pink's (Pink, 2012; Pink and Mackley, 2012) does more explicitly. Taking practice theory as a methodological tool, allows for the design of studies that asks people or follows them through how they perform various household activities, generating thick descriptive accounts of how these activities are performed. This, in itself, is a great contribution to investigations of the experience of energy poverty.

However, proponents of using social practice theory in studies of energy demand insist that there is more to adopting a social practical framework than thinking about energy use in terms of the practices in which it is used. In fact, Shove and Walker (2014) argue that the novel contribution of social practice theory to studies of energy demand is the focus on endogenous dynamics of an integrated package of elements called 'practice' rather than the causal links between any number of 'contextual variables' and energy use, which is seen as an outcome of those:

> In contrast to styles of analysis which attribute change to one or more driving forces, or which consider the production and consumption of energy as a generic resource, conceptualizing energy as an ingredient of specific social practices provides a means of radically reframing contemporary approaches to energy policy and sustainability. It does so in that it situates energy demand as part of, and as in no way separate from, the dynamics of social practice. In this, it provides a means of reinstating fundamental questions about what

energy is for (p.51).

While I am committed to this view of energy as an ingredient of practice, I remain somewhat hesitant in presenting this as a radical departure from previous attempts at developing 'integrated models' or 'cultural models' of energy use. Many of these earlier attempts have also started with the preposition that energy use does not occur independently of a whole host of social and material arrangements around it. The packaging of the integrated subject of analysis has certainly taken various guises from self-admitted arbitrary delineations to the nebulous thing that is culture and to the notion of practice, however, regardless of the guise all attempts at holistic accounts of social life run the risk of defaulting to analytical notions such as 'cause and effect', taking account of a select number of concepts including 'agency', and 'power' as conceptualized in other theoretical frameworks, if they do not present their own parallel analytical categories.

As the studies that layer practice theoretical language onto the behaviourist analytic paradigm demonstrate, this defaulting to analytical categories of other paradigms is already happening to the social practice studies of energy demand. The true test of whether practice theory does indeed amount to a break from the past in studies of household energy use is whether the proponents of taking practices as the central object of study in the analysis of energy demand, spearheaded by Elizabeth Shove and colleagues, manage to produce empirical work that generates analytical insight beyond historical analyses that highlight overarching trends. I emphasize the importance of empirical work because these are in short supply relative to sizeable body of work making theoretical arguments for the use of practice theoretical approaches (Shove and Pantzar, 2005; Shove et al., 2012; Shove, 2010; Shove and Walker, 2014; Shove and Spurling, 2013, for example).

I see parts of this dissertation as an attempt to add to this body of empirical work, which would aim to explain real world phenomena using this theoretical lens. To explain the kind of real world phenomena that I'm interested in explaining, however, a number of analytical clarifications are needed to add to the core concepts of social practice theory. For example: How do material arrangements and practices come together in their so-called bundles? How do practices relate to other practices? What determines the 'hanging together' of certain practices? I devote chapter 3, primarily, to exploring these questions by looking at the relationship between several household practices and the material arrangements that they commandeer in their performances. In doing so, I develop a theoretical language which enables

speaking about securing access to material arrangements (as in enduring infrastructure) and ingredients of practice (as in material that is consumed in a practice).

Armed with a language that enables taking account of the relationship between the materials that Schatzki brackets out of practices and practices themselves, I arrive at a relational social practice theory, which sees practices as connected (or hanging together, to use Schatzki's terminology) through chains of material/social artefacts that are produced in one practice, consumed in others and merely pass through yet other practices — a relational social practice which is in many ways similar to the relational ontologies discussed under theories of justice.

Other parts of this dissertation do not specifically use a social practical lens. I talk of correlations and determinants in Chapter 3, in identifying broad trends in the facing disproportionate energy burdens. I move back and forth between different units of analysis, from households in Chapter 4 to communities in Chapter 5, while exploring some of the connections between the two in Chapter 6. I also explore different mechanisms for addressing energy poverty at these different scales (Chapters 5 and 6). What's common between these is a relational understanding of the social world, an understanding of the problems of energy poverty and access as a justice issue (distributional in Chapter 3 and parts of chapter 6, procedural in chapter 5, and as recognition, throughout), and a view of energy as nothing more than an ingredient of practice, whose securing presents challenges for some and not others.

Chapter 3

Poverty and Energy Poverty: Who Suffers?

3.1 Introduction

Trends in energy poverty can be explored quantitatively using expenditure-based indicators that quantify the burden of securing access to energy services (such as cost of services as percentage of income), using subjective indicators of ability to maintain thermal comfort. The former set, often grounded in actual expenditures, purports to capture a more 'objective' measure of energy burdens, but excludes or discounts the severity of the experience of those who are purposely under-heating their homes in cold weather in order to manage their bills. The latter set of indicators will capture the subjective experience of energy poverty more accurately, but may make comparisons between households with different attitudes and priorities more complicated. In order to account for the challenges of using either set of indicators, some (Healy, 2004, most famously) have created indices that combine both kinds of indicators. However, even with such indices there are questions around the relative weight of each set. More importantly, the creation of such indices is limited by the availability of data. While, the European Household Panel (ECHP) Survey provides access to variables used for both class of indicators for all member states, no such comprehensive survey exists in Canada. Statistics Canada does collect information in its Survey of Household Spending (SHS) that would enable the use of expenditures based indicators, as well as documenting certain key characteristics of the dwellings (such as need for major repairs), but unfortunately does not include any subjective indicator of the ability to maintain thermal

comfort. As such, explorations of trends in Energy poverty are limited to the expenditure based class of indicators.

However, data for Northern territories even in the Survey of Household Spending is often unreliable and not comparable to southern provinces. This places another limitation on quantitative explorations of energy poverty in Canada, particularly since energy carriers are often more expensive in the North and the need for heating more urgent. Furthermore, the SHS does not provide data for First Nations communities, many of whom (particularly those in northern regions of the Canadian provinces) also face much higher energy burdens, due to the higher costs of energy service provision. As a result of these exclusions, any quantitative exploration of energy poverty trends in Canada is fundamentally limited, not only by the fact that subjective measure of the experience is available, but more importantly by the fact that the experience of those who struggle most with high burdens of accessing energy services are systematically excluded from the data. Nonetheless, an analysis of the available data would shed light on trends across the provinces, and would allow starting a more robust conversation on energy poverty in Canada. Thus, in this chapter, I use an expenditure-based measure of energy — namely, the percentage of household income spent on meeting basic household energy needs— to explore broad patterns associated with energy poverty across the Canadian provinces.

3.2 Defining energy poverty

For this purpose, I use the 2011 cycle of the Survey of Household Spending (the last version I had access to at the time of analysis), and more specifically the following variables within it to construct an expenditure-based measure of energy poverty: net annual household income, annual household expenditure on heating and annual household expenditure on electricity. I calculate a percent expenditure value documenting each household's energy burden in the sample. Then using the weights correcting for demographic and geographical representation across Canada, I calculate median percent expenditure values for Canada, as well as individual provinces. Table 3.1, below, summarizes these values.

Using this national median value, an energy poverty threshold at twice the median household expenditure can be established at 5.8%. By this definition, 21% of the Canadian households (or 2.8 million households) are in energy poverty. Establishing a threshold using this method, essentially, treats energy poverty as a relative poverty phenomenon, contending that if a household is spending more than twice the median expenditure as percentage of income value, they're experiencing disproportionately high en-

Province	Median percent expenditure	Standard error
Newfoundland and Labrador	4.8%	0.1%
Prince Edward Island	4.9%	0.2%
Nova Scotia	4.6%	0.1%
New Brunswick	4.4%	0.1%
Quebec	2.6%	0.1%
Ontario	2.9%	0.1%
Manitoba	2.7%	0.1%
Saskatchewan	3.6%	0.1%
Alberta	2.9%	0.1%
British Columbia	2.4%	0.1%
Canada	2.9%	0.0%

Table 3.1: Median expenditure on household energy services as percentage of net income (by province)

ergy burdens. Of course, the question of how much above the median value should be thought of as too much and whether 200% above this median values is high enough will always receive an answer that is seen as arbitrary. I use twice the median value to be consistent with how the classic 10% threshold that UK until recently used as definition for energy poverty is said to have been derived and to stay consistent with other quantitative studies of energy poverty.

Given this threshold the rates of energy poverty in each province as percentage of provincial population, as well as numbers of households in energy poverty are summarized in Table 3.2. It is important to mention that this method of defining the threshold of energy poverty yields a value several percentage points lower than the 10% value that studies from both the Canadian Centre for Policy Alternatives(Lee et al., 2011) and the Fraser Institute (Green et al., 2016) have used (Both organizations seem to have taken the old UK definition without exploring what an appropriate definition should be in the Canadian context). As a result, the estimates of the number of households experiencing energy poverty are higher in this study — at least relative to the Fraser Institute report which estimates 7.9% of Canadian households to be in energy poverty in 2013, where this study finds 21% of Canadian households to be in that category (Green et al., 2016) [1]. The values from Table 3.2 suggest that among the southern provinces, those in the Maritimes have the highest rates of energy poverty (winter heating in these provinces tends to be reliant on more expensive forms of energy, such as fuel oil). Quebec and BC had at the time, the

lowest rates of energy poverty in 2011.

Province	Percentage of total population in EP	Number of households in EP	Standard error of number of EP
Newfoundland and Labrador	39%	81,619	3,323
Prince Edward Island	39%	23,011	1,287
Nova Scotia	36%	141,848	5,978
New Brunswick	36%	112,425	4,460
Quebec	15%	504,216	33,315
Ontario	23%	1,151,561	64,736
Manitoba	19%	89,971	5,823
Saskatchewan	28%	117,323	6,255
Alberta	22%	312,130	19,539
British Columbia	16%	297,415	19,191

Table 3.2: Energy poverty rates (percentage of population in energy poverty) and numbers in each province

3.3 Energy poverty and income poverty

Before expanding on this rough geographical exploration of energy poverty trends, I want to spend some time exploring the ways in which energy poverty is different from and similar to (income) poverty. Of course, conceptually, income poverty and energy poverty are related by virtue of the fact that people with lower incomes may struggle with paying for food, shelter and energy. But energy poverty, especially when defined in the way that I have defined it in this chapter, is not only a function of income and price of energy carriers such as electricity and natural gas, but also the energy efficiency of the house and its appliances. What ultimately determines the how much a household spends on energy is a combination of energy prices (themselves a function of many other factors, including the types of networks of infrastructure they are secured through, as well as regulatory environments), weather, household occupancy patterns, energy needs of the inhabitants, and the efficiency of the house and its appliances in converting a unit of energy to desired services such as heating, cooling, refrigeration, etc. This last variable, as this section will demonstrate, often means that not all those who are in poverty by income measures will

[1]The CCPA study never explicitly suggest a methodology for estimating numbers of households in energy poverty, but instead quote the findings of other studies (McEachern and Vivian, 2010, for example) which seem to use a 10% threshold.

suffer from disproportionately high energy burdens, and conversely, that some households who are not considered in poverty by income measure will be facing high energy burdens.

While Canada has no official definitions of poverty, many anti-poverty advocates use Low Income Cut-off (LICO) value -one of the poverty measures calculated by Statistics Canada- to establish poverty lines. LICOs are calculated for different family sizes and different sizes of towns and cities and are essentially an estimate of income thresholds at which households would spend 20 percentage points more than the average family on food, shelter and clothing. Those would need to spend more than 20% above the average family on securing these essentials of life are deemed low-income (Statistics Canada, 2015b). LICOs are considered a hybrid of absolute and relative measures of poverty: the focus on essentials of food, shelter and clothing (shelter includes energy and water) has echos of absolute measures, while in positioning the percentage of income spent on these essentials relative to an average household it positions itself closer to the relative measures. In this analysis, I also use the LICOs for designating households as above or below a poverty threshold. Table 3.3, below, summarizes the before tax low income cut-offs for 2011.

Size of family unit	Rural areas outside CMA or CA	CA Less than 30,000 inhabitants	CA Between 30,000 and 99,999 inhabitants	CMA Between 100,000 and 499,999 inhabitants	CMA 500,000 inhabitants or more
1 person	16,038	18,246	19,941	20,065	23,298
2 persons	19,966	22,714	24,824	24,978	29,004
3 persons	24,545	27,924	30,517	30,707	35,657
4 persons	29,802	33,905	37,053	37,283	43,292
5 persons	33,800	38,454	42,025	42,285	49,102
6 persons	38,122	43,370	47,398	47,692	55,378
7 or more persons	42,443	48,285	52,770	53,097	61,656

Table 3.3: Before tax LICO values for the year 2011 (Statistics Canada, 2015a)

Having designated households as above or below an energy poverty threshold, as outlined in section 3.2, as well as having designated them as falling above or below low income cut-offs, as discussed above, I construct a two by two matrix of income and energy poverty which would designate households position in terms of both income and energy poverty. Table 3.4 summarizes the percentage of the

(southern) Canadian population that falls within each cell of this matrix.

	Not in energy poverty	In energy poverty
Not low income	68.6%	13.4%
low income	10.5%	7.5%

Table 3.4: Percentage of Canadian population struggling with poverty and/or energy poverty

As this table suggests, almost 70% of Canadians were neither low-income nor energy poor in 2011. However, 13% of the population experienced energy poverty, but not income poverty, where about 11% experienced income poverty but not energy poverty. Furthermore, there is only a 7% overlap between the two categories of low-income and energy poor. In order to further demonstrate the difference between the two categories (and to address concerns over LICO being a conservative measure), Figure 3.1 categorizes those who experience energy poverty and those who don't according to the distance in their income from the poverty line. As this figure suggests, most households in energy poverty have incomes more than 30% above the poverty line.

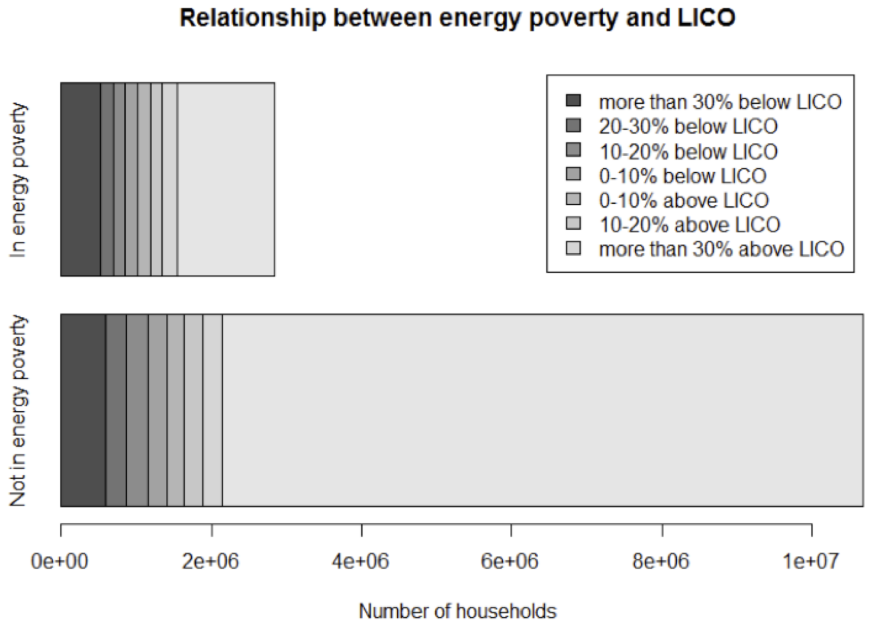

Figure 3.1: Energy poverty and distance from poverty line

To further elaborate on the differences between income and energy poverty, Table 3.5 presents the break down of several demographic categories in each cell in the two by two matrix above. This table

Demographic categories	Total numbers	Neither low-income nor in EP	In EP but not low-income	Low-income but not in EP	Both low-income and in EP
Single Parents	834,333	57%	16%	15%	13%
Couples with children	3,670,064	80%	9%	5%	5%
Households with seniors	3,440,280	60%	21%	11%	7%
Lone senior households	1,244,720	42%	20%	24%	14%
Seniors only households	2,318,654	54%	22%	15%	9%
Renters	4,363,600	58%	5%	29%	9%
Renters whose rent does not include energy bills	1,906,741	61%	11%	13%	16%
Households in government subsidized housing	477,479	19%	5%	62%	15%

Table 3.5: Percentage of households in different demographic categories according to their placement in the 2 x 2 matrix of low-income and energy poverty

suggests that the main differences between those who are in energy poverty or are low-income (but not both) are with regards to seniors, where more seniors tend to be in energy poverty than have low-incomes (with the exception of the lone senior category) and more importantly, with regards to renters, who are more likely to be low-income than in energy poverty. Because renters tend to live in apartment buildings (66% of renters live in high or low rise apartment buildings compared to 8% of non-renters), they tend to use less energy, and thus not find their energy expenses as burdensome as those who live in single detached dwellings (which is the most common type of dwelling in Canada). This last observation reveals housing tenure to be a distinguishing feature of the two categories of 'low-income' and 'facing higher energy burdens' when treated as mutually exclusive categories. In fact, Table 3.6, below, further demonstrates the make up each of the cells in the 2 by 2 matrix according to housing tenure.

What these explorations collectively point to is that when energy poverty is defined as it is here, it distinguishes itself from (income) poverty by becoming a lower-middle class issue (median income for households who are in energy poverty is around $44,000 annually, which is more than double the $17,000 annual income of those who are low-income but not in energy poverty). The majority of those who suffer from energy poverty, then, tend to own[2] their dwellings (which are often larger and single-detached), but spend a disproportionately large portion of their income on maintaining it at comfortable

[2]with or without mortgage

Housing Tenure	Total numbers	Neither low-income nor in EP	in EP but not low-income	low-income but not in EP	both low-income and in EP
Owned with mortgage	4,812,813	79%	15%	1%	5%
Owned without mortgage	4,219,949	69%	21%	2%	9%
Rent	4,363,600	58%	5%	29%	9%
Occupied rent-free	117,647	48%	26%	16%	10%

Table 3.6: Percentage of households in different housing tenure categories according to their placement in the 2 x 2 matrix of low-income and energy poverty

temperatures.

Of course, this is not to suggest that low-income households do not suffer from energy poverty — 1 million households, in fact, are both low-income and in energy poverty. However, addressing the experience of energy poverty for low-income households should primarily focus on increasing incomes, which will reduce the relative burden of securing energy services as well as other necessities. Increasing incomes and reducing inequality will address the part of the problem of energy poverty which is primarily a problem of low incomes. However, to address the part of the problem which is more a function of the energetic performance of the house and its appliances, a different set of actions is, perhaps, recommended. Next section, more specifically explores factors that may contribute to the experience of energy poverty in Canada.

3.4 Energy poverty models

Having identified an appropriate threshold for energy poverty, and having teased it apart from (income) poverty, I develop a logistic model of energy poverty as a function of the key socio-demographic, geographic and household infrastructural variables in this section. I develop this model in three stages, first only accounting for socio-demographic variables, next adding geography, and lastly adding household infrastructural variables. Table 3.7 summarizes the results of the logistic regression models that corelate these various factors to being in energy poverty.

The literature on energy poverty suggests that certain socio-demographic groups are more at risk of being in energy poverty. The study of energy poverty in BC by the Canadian Centre for policy alternatives, for example, suggest that

	model 1: socio-demographics				model 2: model 1 + geography				model 3: model 2 + housing variables			
	Estimate	Std. Error	t value	Pr(> |t|)	Estimate	Std. Error	t value	Pr(> |t|)	Estimate	Std. Error	t value	Pr(> |t|)
Demographic variables												
(Intercept)	1.5E+00	1.7E-01	8.9E+00	<2E-16***	9.4E-01	1.9E-01	5.0E+00	6.8E-07***	-8.2E-02	2.6E-01	-3.2E-01	7.5E-01
Before taxes income	-5.2E-05	3.9E-06	-1.3E+01	<2E-16***	-5.6E-05	4.3E-06	-1.3E+01	<2E-16***	-6.1E-05	4.9E-06	-1.3E+01	<2E-16***
Size of Households	1.8E-01	5.5E-02	3.2E+00	1.3E-03**	1.5E-01	5.9E-02	2.6E+00	9.6E-03**	-5.3E-02	7.2E-02	-7.4E-01	4.6E-01
Single Parents	1.8E-01	1.6E-01	1.1E+00	2.7E-01	1.9E-01	1.6E-01	1.2E+00	2.4E-01	2.0E-01	1.7E-01	1.2E+00	2.3E-01
Couples with children	-4.9E-02	1.7E-01	-3.0E-01	7.7E-01	-1.4E-02	1.8E-01	-7.8E-02	9.4E-01	2.0E-01	1.9E-01	1.0E+00	3.0E-01
Households with children under 3	3.2E-02	1.9E-01	1.7E-01	8.7E-01	8.1E-03	1.9E-01	4.2E-02	9.7E-01	1.4E-01	1.9E-01	7.0E-01	4.8E-01
Households with seniors	-9.1E-02	1.2E-01	-7.7E-01	4.4E-01	-9.4E-02	1.2E-01	-7.5E-01	4.5E-01	-7.5E-02	1.2E-01	-6.1E-01	5.5E-01
Households with a member with a disability	4.3E-01	1.0E-01	4.1E+00	3.9E-05***	3.0E-01	1.1E-01	2.7E+00	6.1E-03**	3.3E-01	1.1E-01	3.0E+00	3.2E-03**
Housing costs	1.4E-05	7.2E-06	1.9E+00	5.5E-02.	1.5E-05	8.0E-06	1.9E+00	6.5E-02.	1.7E-05	8.6E-06	2.0E+00	4.4E-02*
Renters	-3.9E+00	2.3E-01	-1.7E+01	<2E-16 ***	-4.1E+00	2.4E-01	-1.7E+01	<2E-16***	-3.3E+00	2.6E-01	-1.2E+01	<2E-16***
Renters whose rent does not include energy	2.9E+00	2.2E-01	1.3E+01	<2E-16***	3.3E+00	2.3E-01	1.4E+01	<2E-16***	3.1E+00	2.4E-01	1.3E+01	<2E-16***
Households with seniors who rent	-9.2E-01	2.4E-01	-3.8E+00	1.3E-04***	-7.8E-01	2.4E-01	-3.2E+00	1.3E-03**	-6.4E-01	2.4E-01	-2.6E+00	8.3E-03**
Geographic variables (Quebec is reference for province)												
Newfoundland and Labrador					1.3E+00	1.5E-01	8.5E+00	<2E-16***	1.2E+00	1.5E-01	8.0E+00	2.6E-15***
Prince Edward Island					2.0E+00	1.9E-01	1.1E+01	<2E-16***	1.9E+00	2.0E-01	9.8E+00	<2E-16***
Nova Scotia					1.4E+00	1.4E-01	9.9E+00	<2E-16***	1.3E+00	1.5E-01	8.7E+00	<2E-16***
New Brunswick					1.2E+00	1.4E-01	8.9E+00	<2E-16***	1.1E+00	1.4E-01	7.9E+00	1.0E-14***
Ontario					1.1E+00	1.4E-01	8.4E+00	<2E-16***	1.1E+00	1.4E-01	7.6E+00	8.3E-14***
Manitoba					3.5E-01	1.4E-01	2.5E+00	1.4E-02*	1.7E-01	1.5E-01	1.1E+00	2.6E-01
Saskatchewan					1.2E+00	1.5E-01	7.9E+00	1.1E-14***	9.7E-01	1.6E-01	6.1E+00	1.2E-09***
Alberta					1.3E+00	1.6E-01	8.0E+00	3.4E-15***	1.2E+00	1.7E-01	7.0E+00	6.2E-12***
British Columbia					-8.9E-02	1.6E-01	-5.7E-01	5.7E-01	-3.7E-03	1.7E-01	-2.2E-02	9.8E-01
Rural Households					5.2E-01	1.1E-01	4.6E+00	5.0E-06***	2.7E-01	1.2E-01	2.2E+00	2.5E-02*
Housing quality variables												
Number of rooms in the house									5.0E-01	5.9E-02	8.6E+00	<2E-16***
Single-detached houses									7.4E-01	1.3E-01	5.8E+00	1.0E-08***
Dwelling in need of major repairs									4.5E-01	1.4E-01	3.3E+00	9.3E-04***
Period of construction for dwelling									-7.3E-02	2.8E-02	-2.6E+00	9.4E-03**
Over-crowding									-3.9E-02	3.2E-01	-1.2E-01	9.0E-01
Residual Deviance			0.6795				0.6407				0.5991	

Table 3.7: Logistic models of energy poverty

> Energy poverty is more prevalent among certain types of households, including single parents (mostly female), seniors, and young adults, all of whom are more likely to be renters and live in older and less energy-efficient housing stock (Lee et al., 2011, p.13).

However, this claim does not seem to be substantiated by other data or references to other research. In fact, when considering only socio-demographic variables (model 1), with the exception of households where a member lives with a disability none of the household types investigated here are significantly associated with being at an increased risk of energy poverty. What does seem to be significant is income (the higher the income the lower the likelihood of being in energy poverty, obviously), the size of the household (the more members in a household the higher the likelihood of being in energy poverty) and various housing tenure type variables. Higher total housing costs seems to be marginally significant in increasing chances of being in energy poverty. Renters as a whole group are less likely to be in energy poverty than non-renters — however, renters for whom none of the energy costs are included in rent are at an increased risk indeed. The interaction term for the variables 'seniors' and 'renters' also suggests that seniors that rent their accommodations are significantly less likely to be in energy poverty. What this investigation of the socio-demographic variables suggests is that patterns of energy poverty in Canada, at least, do not align with categories of households typically thought to be more vulnerable to the experience.

The addition of geographical variables to the model confirms that rural households are indeed more likely to be in energy poverty than their urban counterparts. Furthermore, this model is in line with the incidents of energy poverty in each province laid out earlier.

Finally, the addition of housing variables suggests that every additional room in the house increases the log-odds of being in energy poverty by 0.5. Furthermore, taking account of this variable (here used as a proxy for the size of the house) does not render the effect of rurality insignificant, but reduces the magnitude of its estimate, suggesting that rural households are at an increased risk of energy poverty at least partially because rural houses tend to be larger. This model also reveals that single detached dwellings as well as those in need of major repairs are, unsurprisingly, at a higher risk of energy poverty. Furthermore, living in newer buildings decreases the odds of being in energy poverty.

Over-crowding[3] seems to have no significant effect on chances of being in energy poverty.

[3] Over-crowding is defined by the Canada Mortgage and Housing Corporation (CMHC), according to the National Occupancy Standard (NOS), as a situation in which not enough bedrooms are available in the house. Enough bedrooms means

3.5 Conclusion: energy poverty in Canada

Given the key exclusions of First Nations communities and Northern Canada, the picture of energy poverty that emerges from this exploration using expenditure-based metrics suggests that energy poverty is a problem somewhat distinct from poverty through the influence of housing infrastructural variables. In fact, based on this analysis it would seem that the majority of those who are suffering from higher energy burdens have incomes more than 30% above the LICO-based poverty lines — these are often households who own their single-detached houses, which tend to bigger, and for some in need of major repairs (though not necessarily older). The often mentioned demographic groups of single parents, seniors and households with small children do not seem to be at a significantly higher risk of energy poverty.

Geographically, incidences of energy poverty are higher in the maritimes, followed by provinces that have deregulated or semi-deregulated electricity markets (Alberta and Ontario). Quebec, British Columbia and Manitoba (incidentally, provinces that primarily rely on large crown corporation owned hydro facilities for the production of their electricity) have the lowest incidences of energy poverty in southern Canada. Rural households, regardless of their home province, have higher chances of experiencing energy poverty.

However, I would like to reiterate that this picture is inherently incomplete. Not only does it exclude communities that we have reason to believe face the highest energy burdens[4], but also in its focus on expenditure-based measures discounts the experience of households who intentionally under-heat their homes to manage their energy bills. The use of consensual measures of energy poverty, such as subjective indicators of whether households feel they can afford to maintain comfortable temperatures in their homes, would improve analyses of energy poverty by giving full weight to the experience of this group. The following chapters aim to expand on this rough analysis by considering non-expenditure based measures and delving deeper into the processes that create energy poverty.

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one bedroom for: "each cohabiting adult couple; each lone parent; unattached household member 18 years of age and over; same-sex pair of children under age 18; and additional boy or girl in the family, unless there are two opposite sex children under 5 years of age, in which case they are expected to share a bedroom. A household of one individual can occupy a bachelor unit (i.e. a unit with no bedroom)" (CMHC, 2014).

[4]For urban First Nations communities, the combination of lower incomes and the reliances on predominantly single-detached homes constitute an exacerbating factor. For, Northern, remote and rural communities the additional cost of energy on a per unit basis, as well as often colder temperatures would increase burdens of access to energy services

Chapter 4

Nobody is Cold

4.1 Introduction

In the Introduction, I laid out an overview of energy poverty across Canada and in addition to highlighting the important insights of this analytical view, discussed several shortcomings of such an analysis. These shortcomings, generally, relate to one of two problems: a) a lack of availability of certain kinds of data, including subjective indicators of thermal comfort and energy burdens, as well as data on northern and remote communities and First Nations reserves, who arguably, and as I will demonstrate in this chapter, face some of the highest energy burdens in the country; And b) problems relating to the use of energy expenditures as indicators for energy poverty and its experience. In this chapter, I turn to a case study chosen, specifically, to allow for an exploration of some aspects of energy poverty that was left out of the previous discussion.

This chapter, then, focuses on experiences of precarious energy access in a northern, 'remote' and First Nations community in British Columbia and does so by taking a practice theoretical approach to studying energy use at the household level. Where the previous chapter was dedicated to demonstrating the existence of immense inequalities in access to energy service across Canada, and highlighting some of the factors that contribute to the production of these inequalities, this chapter focuses on demonstrating just how these access challenges affect people's daily lives. In this case, I start with a view of vulnerability as something constituted in everyday life, in engagement with material and discourses of 'doing things'. Therefore, rather than relying on consumption and expenditure measures of energy use/poverty, I take household practices as sites of manifestation for energy access problems. Using this

approach and a mixed-methods design that relies on data from interviews with households, energy mapping exercises designed around household routines, survey data and ethnographic-type fieldnotes, I aim to look at multiple manifestations of precarious energy access.

This investigation of the everyday manifestations of energy poverty serves the function of addressing the second element of Walker's (2012) justice claims framework. As discussed in the theory section, Walker views all justice claims as composed of three elements: a description of an inequality, a discussion of why that inequality matters, and an analysis of how that inequality is produced. In discussing energy poverty in the previous chapter I predominately engaged with the first and third elements of this framework, and beyond making vague gestures in the direction of health implications of living in energy poverty, I did not attempt to answer why these inequalities matter. In this chapter, however, I centre the discussion on the second element of this framework. I still demonstrate the existence of inequality in energy access as it affects the residents of this remote community, and I discuss some of the ways in which it comes about (though refer to next chapter for a more robust discussion). But for the most part I aim to show how precarious energy access manifests itself in, and affects the lives of folks who experience it. The implication of this talking about how lives are affected by the experience of energy poverty is that some of the ways in which they are affected is not 'acceptable' and the experience of inequality matters because these conditions are unacceptable.

Here, I want to briefly make visible the body that does the judging on what is deemed acceptable (hello reader!). As far as I'm concerned, this body is the contingent, heterogeneous and decentred 'we' of the theory chapter with its political responsibilities to one another. These responsibilities include respect for people's agency, individually and collectively, in determining their life courses, including those that defy mainstream notions of the good life, as well as facilitating the conditions that enable these lives to flourish, individually (i.e. not dying of the cold) and collectively (i.e. being able to participate in collective lives free of the stigma of being "unwashed"). In other words, what is being deemed unacceptable is conditions that prevent the flourishing of individual and collective lives. In making this 'we' and its responsibilities and judgements explicit, I hope to make clear the notions of acceptable and unacceptable to which I am not appealing. In particular, I hope to de-stabilize the notion of the unacceptability of 'third world' conditions for 'first world' lives and the ambiguous position afforded to First Nations communities in Canada in that dichotomy (Stryker, 2011) . This distinction between first and third world poverty (or poverty in the Global North and South, as the more polite academy insists)

forms a central part of the Canadian political discourse on tackling poverty in Canada's indigenous communities (see CBC News, 2007; Commisso, 2013; Levasseur and Marcoux, 2015; Spurr, 2016; Stastna, 2011, for example), but serves to reinforce the entitlements of this first world in ways that a discussion of poverty that is also attentive to race would find problematic.

Making visible the judgement of this 'we' in evaluating parts of other people's lives is, in my view, an important part of discussing why inequality matters. However, the judgements of those whose lives are impacted by these persistent inequalities, in this case in energy access, are without a doubt even more important, and often the only clues we have as to how these inequalities are experienced. In adopting a social practice theoretical approach to the study of energy poverty, I've aimed to give primacy to these experiences by locating the manifestation of energy poverty in accounts and observations of how the things of everyday life are done, and how failure in the successful accomplishment of these things hinders not only the physical survival of some individuals, but their ability to participate in the social life of their communities. I will begin by outlining how social practice theory may be used to discuss questions of inequality, including the development of a language of access, which I deem essential in discussing inequality in access to energy services. I, then, introduce the details of my case study and go about answering the question of how energy poverty manifests itself in household practices: in how activities are performed, in when practices are deemed (un)successful and in how energy use and access is talked about?

4.2 Theory

4.2.1 Social practice theory and inequality

Social Practice Theory (SPT) demands a focus on what energy does, rather than 'energy' in the abstract. And what energy does is what gets accomplished in social practices like cooking, commuting, and bathing. Partaking in these practices, not only provides for the meeting of some material need, but, more importantly, allows participation in social life. Practices, as I've already discussed, indeed, make up social life. What's at stake, when I talk about energy poverty, therefore, is not how much energy a household might use, but rather whether they have the ability to fully partake in social life. Defining this social life in terms of a series of practices that are relevant to energy use, I can look at how these practices get performed, and if/when compromises are made in the successful performance of them due

to access challenges.

However, social practice theory, at least as conceptualized by Schatzki (Schatzki et al., 2001; Schatzki, 1996, 2002) and used by Elizabeth Shove and her collaborators (Hand and Shove, 2007; Shove and Pantzar, 2005; Shove, 2010, 2012, 2003) lacks the vocabulary for talking about inequality and the politics of its creation. There are, as it happens, several critiques of Social Practice theory on the grounds of its engagement (or lack there of) with concepts of inequality and questions of politics. For example, Andrew Sayer (2013) offers a critique of Social Practice theory and its conception of agency on the basis of its political implications. Focusing on SPT's discounting of people's understandings of why they do what they do, Sayer argues that it strips individuals of their reflexivity and autonomy while in its emphasis on the importance of policy places all agency and political power in the hands of a policy elite:

> On the one hand ordinary people's active, evaluative relation to what they do is not acknowledged, while on the other, policy makers' actions with respect to them are, of course, assumed to be guided by precisely such normative reason. This is problematic not only because of its inconsistency, but because of its political implications: policy and politics then become a matter of manipulation of the public by an elite, which monopolises the capacity for practical reasons. (p.172)

While one of the many appeals of a practice theoretical approach to studying energy use is the deemphasizing of individual choice and the language of 'decision making' that goes along with it in economics, psychology, and engineering approaches, Sayer's critique highlights the political problems associated with this over-correction.

Many of the actions involved in the practices of everyday life are indeed routine performances that may not involve much reflection on the part of their practitioners. However, this observation should not preclude the possibility of active reflection or creative manipulation of the elements of practice. Much of what I've learnt in working with communities that may be thought of as in situations of precarious energy access, indeed is an account of reflexive, adaptive coping strategies employed by community members in dealing with this precariousness. In fact, I would suggest that the ability to perform practices of everyday life in an unreflexive manner is a privilege itself, unavailable to those whose access to basic services is always on the verge of being interrupted.

Breakdowns and interruptions, Frank Trentmann (2009) argues, "can serve as a temporary flashlight, illuminating dynamics of everyday life that lie obscured in more continuous and holistic accounts of consumer culture (p.89)". Those who live with constant interruptions in energy services can offer conscious reflexive accounts of the ways in which they perform practices that have significant bearing on their energy use. The coping strategies of my interview participants discussed in this chapter, offer a corrective to the view of practitioners as unreflexive automatons, and highlight the need as well as the possibility of understanding practices through narratives offered by practitioners.

Other critiques of Social Practice theory as a framework for talking about issues of energy poverty and environmental justice centre around its inability to account for inequalities. There are indeed very few examples of research that employ social practice theory to account for social inequity or the experience of poverty. A possibility is offered by Walker (2013) using the analytical distinction between 'practices as entities' and 'practices as performances' to enable speaking about the experiences of material poverty as ones that can be viewed as instances of failure to successfully perform a practice. Walker then goes on to suggest that Sen's capabilities framework (Sen, 1985, 1999) can be paired with social practice theory to discuss these experiences as failure to achieve the functionings of Sen's framework and the practices of everyday life.

While there are parallels between Sen's capabilities framework and teleologically organized practices, there are also incomensurabilities between the two, particularly when it comes to questions of agency and choice. However, Walker's (2013) discussion of the analytical distinction between practices as entities and practices as performances goes some way towards enabling discussion of differences in performances and outcomes of those performances for different people — a topic that social practice theory tends to shy away from, if not actively dismiss. While this distinction opens up the possibility of talking about differential outcomes of performances for different groups of people, it shines little light on why those differences exist. I would suggest that social practice theory's inability to talk about inequality in performances and outcomes stems from an ambivalence towards the processes by which materials required for practices are accessed and used in practices and their performances.

In a recent paper, Shove and Walker (2014) discuss Schatzki's conception of material arrangements as something outside of and prefigurative to practices. They go on to suggest that in Schatzki's (2006) formulation of practice theory "practices 'happen' (in the present)," while "material arrangements and infrastructures 'exist'" (Shove and Walker, 2014, p.50). The delegation of practices and the mate-

rial arrangements required for their performances to two different temporalities creates a taken-for-grantedness of materials in the moment of the performance of practice.

Shove and Walker (2014) insist that this prefigurative existence does not grant material arrangements a power of their own as externalized factors, but rather that these material arrangements only have effect "in and through the trajectories or 'lives' of specific social practices" (p.50). What SPT remains silent on, however, is how these pre-existing material arrangements are brought into practices. SPT would contend that the knowledge and expertise gained by practitioners over time includes an understanding of the need for certain material arrangements. In taking these material arrangements for granted, as pre-existing and prefigurative, these formulations of SPT ignore the question of how access to these material arrangements is secured. So, while the practice of cooking contains knowledge of the need and use of, say, a gas stove, practitioners of social practice theory in their analyses of the practice of cooking take the presence of the gas and the stove for granted. Of course, neither the gas nor the stove simply 'exist.' Access to the gas is secured through a contract with a natural gas supplier and arrangements for payment in exchange for the commodity, assuming that physical access to networks of natural gas distribution is already secured in the building in which the cooking is to take place. Access to the stove might have been secured by buying a stove, by stealing one, by building one or might be continuously negotiated and secured by making arrangements for the use of a neighbour's stove.

The triviality of the example, perhaps, serves to reinforce why the existence of these material arrangements is often taken for granted and questions of access never arise. However, it should also demonstrate how the taking for granted of the existence of material arrangements in SPT analyses would preclude discussions of inequality, where what's at stake is very much the securing of access to these 'existing' arrangements of material. This chapter, therefore, takes as its theoretical goal the unsettling of that taken-for-grantedness of material arrangements in the lives of practices, and aims to empirically demonstrate that the shapes of everyday practices have everything to do with the arrangements and relationships of access to these taken-for-granted materials of practices. In doing so, however, my primary goal is to present a descriptive account of how inequality in access to energy is experienced and how the lives of those who experience precarious energy access is impacted.

4.2.2 A language of access

Having identified the taken-for-grantedness of access to material arrangements in practice theoretical accounts as one of the prime reasons for the challenges in producing work on inequality using this framework, I propose a language of access to specifically enable talking about how access to material arrangements is secured through various active strategies on the part of practitioners and practices themselves.

Practice as a nexus of sayings and doings includes knowledge of materials required by the practice and modes of securing them. Practitioners in developing the requisite skills for a practice learn a myriad of detail about the material arrangements that are used in practices in which they partake. They will learn, say for the practice of cooking, about the quality of various ingredients, where to buy them so they are freshest, cheapest, or in case of speciality ingredients "available". They might learn how to grow or hunt some of their own ingredients or choose to import in bulk and store in various ways those that are not available in their area. They will learn about appropriate kitchen equipment that will enable or facilitate the use of their ingredients. They will learn where to find these items for purchase, and may well choose to build some of these equipment or modify their existing ones to enhance their functionality in dealing with any new ingredients employed in their cooking practice. This knowledge, well-established in experienced practitioners, will include a distinction between socially sanctioned modes of securing access to materials and more 'deviant' ways of accessing the same material (e.g. buying, borrowing, vs. dumpster diving, stealing). It will include an understanding of the established and conventional ways of accessing materials, as well as the possibility of creating new economies of access (e.g.the emerging, so-called sharing economy and its constellation of practices).

Unpacking this question of access, as these examples attempt to do, reveals that securing access to the materials required for practice is an integral part of the practice itself, often involving partaking in a constellation of other relevant practices, and more often than not involving the ability to participate in economic exchange. While the expert practitioner navigates this securing of access with ease, the novice practitioner or a practitioner lacking in the monetary resources required for securing access might struggle. But regardless of the ease with which access is secured, securing access, as Alan Warde (2005) says of consumption, is a moment in every practice. In case of materials with global supply chains, securing access entails tapping into these networks and in some cases requires accessing infrastructure

that function as mediators between these 'resources' and practices.

This tension between practices as actions within a geographically bound notion of the 'local' and the global supply chains that secure access to commodities is another facet of the problem with taking the material arrangements of practices for granted. The version of SPT that I most use and rail against, often implicitly, and sometimes explicitly bounds them to the realm of the habitual and homely. While the materials of practices (the ones taken as 'existing') often travel vast distances and navigate complex political economies before partaking in the performances that make up practices. Therefore, in troubling this tendency of SPT I look to Cultural Studies, where an interest in accounting for 'cultural consumption' has generated a body of social practice work, following Reckwitz (2002), which pays much closer attention to these material arrangements than the work of Schatzki and Shove allow (see Hargreaves, 2011a; Halkier et al., 2011; Gram-Hanssen, 2011, for example). Furthermore, where Schatzki's work views practices as 'stable', this body of work allows for considering performances of different practices as sites for innovation and change.

There are, as I mentioned in the theory chapters, important critiques of this body of work, particularly on the extent to which they take practices as the central object of study rather than using practice language to explain something else of interest. However, regardless of this critique, the reintegration of material arrangements back into practices is an important contribution of this work. Practices have an intimate relationship with their material arrangements in the sense that all practices, use, consume or produce materials that are then used, consumed or modified in other practices. Material arrangements, in this sense, are very much the link between various bundles of practices. The ways in which practices and their requisite material arrangements come together, therefore, have much to do with what practices may 'hang together' in a bundle of practices, to use Schatzki's terminology. Schatzki might use this terminology to refer to geographically and temporally close practices like 'grocery shopping', 'urban community garden participation' and 'cooking', but the chains can and do extend to temporally and geographically distant practices. Therefore, in expanding on the relational ontology of practices discussed in the theory chapter, I take a supply chain view of practices, and analyze the performances of the various practices of home maintenance as part of long chains of practices linked through material and energy flows - a sort of follow the thing game (Cook, 2004) with energy.

I would like to clarify how this approach is different from doing an analysis of energy flows — the kind that often is represnted by Sankey diagrams. The purpose of those analyses is often accounting for

the end-uses of various kinds of energy carriers/commodities. Extending those diagrams into the home, would generate more detailed accounts of where energy goes and perhaps begin answering the question of what energy does but would not account for any qualitative difference in the performances that use the same energy commodity. Taking practices as the focal point and working out to where energy comes from, on the other hand, would enable an explicit taking account of how differences in performances relate to the specifics of material arrangements and how they are accessed. This analysis therefore foregrounds the procedures of securing access to materials and material arrangements in performances of household practices.

In securing access to materials and material arrangements, I will talk about two kinds of materials and material arrangements: Those that will directly get used or consumed in the practice (I will refer to these as ingredients) and those that by transforming and transporting these materials mediate access to the first class of materials (infrastructure). For both groups of materials, there are a number of questions at the heart of issues of access, specifically regarding ownership of these material arrangements, the processes through which ownership itself or use rights are transferred so that material arrangements can be used in practices, and the entities that govern and regulate this transfer. Therefore, in talking about strategies for securing access to material arrangements I will use the following terminology to highlight the various elements in the chains of access:

Ingredients of practice: Material directly used or consumed in practices. Food ingredients and gas for cooking, for example. With regards to energy, I classify 'energy carriers' such as electricity, natural gas and wood, under this heading.

Infrastructure of practice: Material arrangements used to transform the ingredients of practice to usable state and transport to location of use. Infrastructures of practice are products of other practices. In this sense, this class of material arrangements are closest to what Schatzki terms 'existing' material arrangements. Powerplants, electricity grids, pipelines, trucks, and roads, on the one hand, stoves, and other kitchen equipment on the other.

Transactions of a practice: the 'moment' in which use rights/ownership of ingredients or infrastructure is transferred from one entity to another. Direct market exchange, for example, for the purchase of vegetables used in cooking, or service contracts with and payment of bills for utility companies. These transactions are governed by a number of relationships.

Pathways of access: pathways leading to transactions for securing of access to ingredients. It's

important to note that there aren't always multiple pathways to securing of ingredients. But as an example, purchasing electricity from the local utility company (or companies) versus generating one's own electricity via solar panels constitute different pathways to accessing electricity as an ingredient.

Relationships of access: the relationships governing the transactions of practice. These include financial, familial, communal, legal, moral rules and norms around how transactions take place and how entities engaged in transaction are responsible to each other.

With this language of access in mind, I will begin discussing the ways in which precarious energy access manifests itself in the village of Tsay Keh.

4.3 Tsay Keh and energy access

The village of Tsay Keh is located in the Rocky mountain Trench, about 430 km north of Prince George, BC. The community can be accessed via a nine to eleven hour drive on logging roads or, as I did, by a small plane. The Tsay Keh Dene are Sekani people, related by kinship and intermarriage to the neighbouring communities of Kwadacha and Takla Lake. The total population of the Nation as of December 2014 wass 477, less than half of whom live in the village (AANDC) . I did my fieldwork in Tsay Keh during February and March of 2013. At the time there were 73 houses in the village with plans to build 12 more in the following years. I interviewed 42 of these households during my fieldwork, including all households that were in the village at the time and willing to talk to me, and as guided by my two community research assistants.

Tsay Keh is one of about 30 communities in British Columbia (and among over 250 such communities in Canada) that are classified as 'remote' communities. Natural Resources Canada designates a community as remote if it is a permanent settlement (more than 5 years old), with at least 10 dwellings, and without access to the electricity grid or the natural gas network (Natural Resources Canada, 2011). Remoteness in the case of these communities necessitates special arrangements for the provision of energy needs, often involving community or privately owned generators for electricity and the use of wood, propane or fuel oil for heating — all but wood, constituting much more expensive modes of access to energy services than those provided by the networked arrangements of energy service provision.

Tsay Keh's remoteness from networks of energy distribution is, however, a complicated remoteness: The community is situated at the northern tip of the Williston reservoir, BC's largest reservoir, supplying the hydroelectric force behind the WAC Bennett dam, which generates about one third of all electricity

generated in BC Hydro. What's more, the community was displaced from their homes for the purpose of the development of this dam.

BC Hydro's website boasts the WAC Bennett dam as "one of the world's largest earthfill structures" (BC Hydro). The construction of the dam started in 1961 and lasted until 1968, at a time when the political forces at play in BC, exemplified by the then Premier WAC Bennett, were actively engaged in projects of transformation of nature and its resources to the end of creating a particular vision of BC: an urban, connected and prosperous British Columbia (Loo, 2004). In the process of this transformation, the WAC Bennett dam, flooded 350,000 - 400,000 acres of land at the confluence of the Finlay, Peace and Parsnip rivers and drowned the Tsay Keh Dene villages of Fort Grahame, Finlay Forks and Ingenika (Loo, 2007; Baker et al., 2000).

The displaced people of Tsay Keh Dene eventually settled in Ingenika Point where they awaited, until 1989, a resolution to the federal and provincial negotiations on the nature of resettlement and compensation. In 1989, they relocated to their current village at the northern tip of the reservoir, where they remain disconnected from the grid[1].

4.3.1 Meeting energy service needs in Tsay Keh

Electricity

Like many remote, First Nations communities, the village relies on a battery of diesel generators and a community grid to supply electricity to the village. Electricity is used for lighting, refrigeration, some cooking (some stoves are electric, some propane), some heating (through the use of plug-in heaters and baseboard electric heating in the newer houses), as well as powering electronics. The generators in the village produced 1520 MWhr of electricity in 2011, with a peak of 394kWe (Wilson, 2013).

Historically (and currently) the community's elected band council government has paid (and continues to pay) the financial costs associated with the generation of electricity for the entire village. The operation of the diesel generators has been the responsibility of the nation (through various private contractors, including BC Hydro) until 2013 and solely with BC Hydro through the Remote Community Electrification (RCE) program since then. Prior to the implementation of the RCE, Indigenous and Northern Affairs Canada (INAC) provided funding for electricity provision using a curious formula tak-

[1] I cover more of the history of dam development and its impacts on people of Tsay Keh Dene in the following chapter, where I situate it within a discussion of the provincial electricity policy in BC

ing as its basis an annual 9 MWhr average electricity demand per residence. This average for Tsay Keh, was 13.5 MWhrs per residence for 2011 (Wilson, 2013) and has grown to about 15 MWhrs for 2015. Any amount of electricity use beyond the 9 MWhr was not covered by INAC. Since the responsibility for electricity provision was transferred to BC Hydro in 2013, this INAC funding goes to BC Hydro directly and BC Hydro charges the community for its electricity use at rural BC rates [2].

Table 4.1, below, summarizes relationships, pathways and infrastructure of access for households accessing electricity in the village. I have traced the chain of access only one step outside of the house — in case of Tsay Keh, this happens to lead to the moment of electricity generation itself. However, chains of access to ingredients of this step (e.g.the diesel) can be traced much further back, to oil extraction and its politics. This stepping outside of the home to trace of chains of access in practice, as I have argued, is intended to disrupt the taken-for-grantedness of materials and reveal the ways in which pathways to and relationships of access are important in the performance of practices themselves. In the case of access to electricity in the village, it is important to note the presence of the mediating entity 'elected government'. The elected band council government is the mediator between the household and electricity provider, handling the financial transaction on behalf of the entire community. As I will demonstrate in the following section, the presence of this mediating entity has profound implications both for how household maintenance practices are performed, and for how energy poverty and vulnerability is experienced in the community.

Propane

In Tsay Keh households, propane is an ingredient to a number of practices: The older houses in the villages (built in 1990) were built with dual propane/wood furnaces, making propane a heating fuel for some houses. Newer phases of housing construction have not followed this trend — in fact, the newest of the houses are equipped with wood stoves and baseboard electric heaters. And though the majority of the houses are equipped with propane burning furnaces, few households use propane as their main heating fuel due to its cost. As Figure 4.1 shows, the majority of the households that I surveyed use wood for heat. Many use propane for times that wood can't adequately meet their comfort needs (in the spring, for example, when burning wood would make the house too hot for comfort) or when they are away in winter and want to ensure that their pipes don't freeze.

[2]Rural or Zone II rates are about 20% higher than Zone I rates in BC

Ingredient	Electricity
Infrastructure	Diesel generators, community grid, diesel transportation networks via tankers and trucks
Pathways to access	Only through the community grid for those living in the village. Through the use of personal generators for those living in cabins outside of the village.
Relationships of Access	Between households and nation's elected government: Residence-based. All residents receive free electricity. Between nation's elected government and electricity provider: charged at rural BC rates through the RCE program.
Moment of Transaction	For households: plugging in For nation's elected government: Signing contract with RCE. Receiving monthly bills.

Table 4.1: Access to electricity

The most common use for propane, in the everyday life of the village is for water heaters. Though residents and the nation's elected government are starting to make a transition to electric water heaters, the majority of the households in the village still use propane water heaters. Figure 4.2, below, shows fuel sources for water heaters in the village (the None response belongs to a household who didn't have a water heater). Fuel source for cooking is also a mix of propane and electricity for different households, depending on whether the house was equipped with an electric or gas stove.

Propane is, therefore, used for cooking, heating, and activities that require hot water to varying degrees, for various households. All but the newest of houses in the villages (a total of 6, 4 of whom are present in my sample) use propane in the house for some purpose. These households gain access to propane following one of two pathways: Elders (whose propane expenses are covered by the nation's government) and those who can afford large lump sum payments have accounts with a propane distributor (Superior Propane) from Prince George, who delivers propane to the village and fills their large propane tanks a few times in the year, depending on use. Those who can't afford the payments, or prefer to more closely manage their propane use, buy propane from the local store in 100-pound tanks, which last between 2-4 weeks before needing to be refilled.

Table 4.2 summarizes these pathways and relationships of access. Please note, again, the presence of the nation's elected government as a mediating entity in the elders' pathway of access to propane.

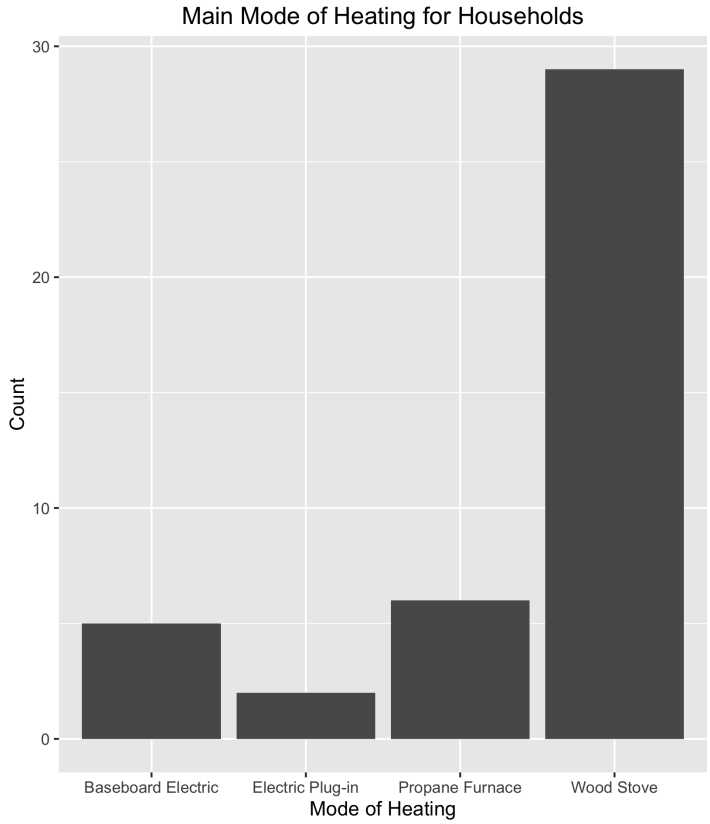

Figure 4.1: Main source of heat among Tsay Keh households

Ingredient	Propane
Infrastructure	100 lb propane tanks, large household propane storage tanks, larger propane storage tank at community store, propane transportation truck
Pathways to Access	Households can purchase small, 100 lb tanks of propane from the community store Households who can afford larger sum payments and elders whose propane expenses are covered by the nation's elected government have contracts with a supplier in Prince George, which delivers propane to their homes to be stored in their large propane storage tanks.
Relationships of Access	For most: purchase from either community store or Prince George supplier. For elders: community membership.
Moment of Transaction	At delivery time, or purchase point.

Table 4.2: Access to propane

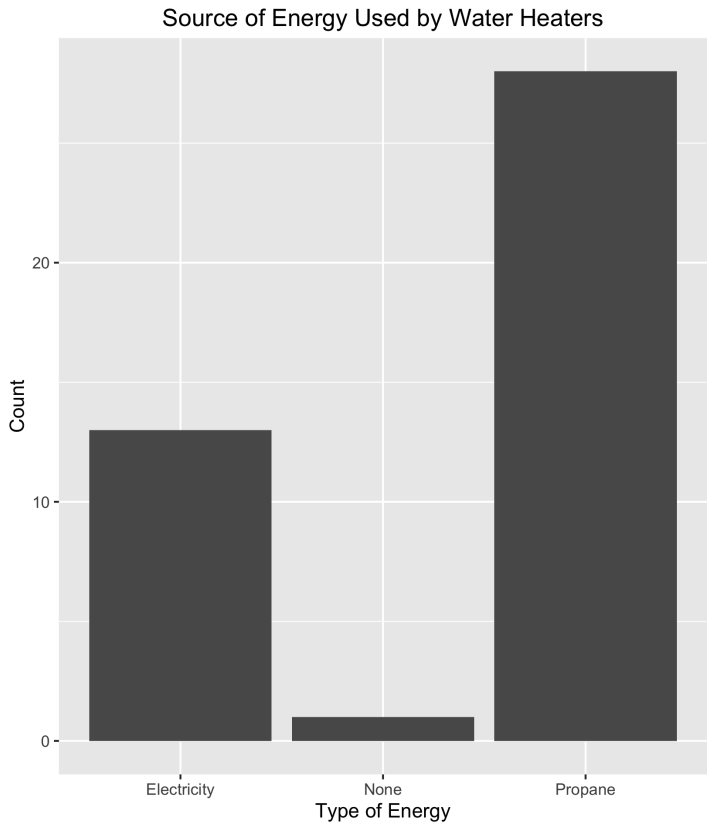

Figure 4.2: Main source of for water heaters

Wood

As Figure 4.1, above, suggests, wood is the main heating fuel for households in the village. Wood collection for winter use is carried out throughout the year, sometimes as outings for the entire nuclear family, others by members from different nuclear families. The nation's government has a wood collection program, which employs individuals to collect wood for elders and those who can't collect their own wood. Access to wood, 'as a resource' that can be chopped down and brought into the home is granted through community membership, while familial relationships mediate the actual collection process. Table 4.3, below, summarizes these pathways and relationships of access.

4.4 How people do things or a note on methods

My work in Tsay Keh attempts to study "practices in practice" while avoiding the more intrusive methods of doing so. As such, I developed a method for an energy mapping exercise that invites participants to draw maps of their home, talk about the kinds of things they do in each room, place on this map

Ingredient	Wood
Infrastructure	Chainsaws, trucks (both ingredients of the practice of wood collection), wood stoves
Pathways to Access	For elders or those with mobility challenges (both in terms of physical fitness and having access to a truck): nation's elected government wood collection program or collection by family members. For other households: collecting own wood.
Relationships of Access	For those collecting their own wood: community membership as granting access to wood in territory For those relying on others for wood collection: community membership and familial support
Moment of Transaction	Cutting of wood (and delivery to home)

Table 4.3: Access to wood

their energy consuming equipment and discuss the manner and frequency of use of each item in various practices. These sketches and "maps" were not intended to provide a visual of where the most energy intensive activities take place — but were, rather, intended to help participants think about their various activities in a spatially grounded way without requiring the physical intrusion of having a researcher in their home. In other words, the method was designed to allow individuals to participate in the interviews at a location of their choosing. And in fact, seven of the 42 household interviews I conducted in Tsay Keh took place at places other than the interviewee's homes (this includes their place of work in three cases, at the administration office in another three cases, and at the community health centre in the last case).

In practice, many participants not only invited me in to do the mapping exercise, but insisted on showing me how some practices were performed and what configuration of appliances they used to achieve various goals. Transcripts from these interviews include my narration of things that I am being shown, which supplement the output of the mapping exercise and my own fieldnotes from the visit.

I coded this data in several phases, first quantifying information from maps and interviews, then open-coding interview transcripts for emergent themes, and finally coding with the categories of my theoretical framework. I should mention that the categories I proposed above to enable the use of social practice theory in talking about resource access and equality are loosely based on the emergent themes of the first phase of coding.

For each household visit, therefore, I have an interview transcript, a quantitative survey, a record of maximum and minimum temperatures and relative humidity in the livingroom over a 24 hour period, and housing activity maps, including their quantified versions. For most households, I also have access to historic electricity consumption. This information collectively paints a picture of how household practices are performed in different households in Tsay Keh. In the following section, I will present descriptions of several of these common household practices, highlighting moments of compromise and relationships of access.

4.5 How people do things

Before I dive into descriptions of household activities, I want to reiterate the reasons for the inclusion of such 'mundane' details of how household activities are performed. At the most obvious level, studying the mundane activities of life includes a large degree of minute detail which is hard to 'make interesting'. But why ask such questions in the first place and how does it relate to energy poverty/justice? I ask them because taking practices and their performance as sites of the social and fundamental units of analysis necessitates engaging with the detail of their performance. It is in such detail that normative understandings about how practices should be performed is revealed and questions, like what do 'successful' performances achieve and what desired qualities are compromised when performances are not deemed successful, are answered. In other words, the details of how different practices are performed and what levels of 'success' these performances entailed help answer the bigger questions of how is energy poverty experienced for those who experience it, and what consequences it has (what things are compromised on) for them.

4.5.1 Laundry

> I guess I'll ask you about laundry next. Um, how do you do your laundry? Like how many loads do you do in a week? How full is it? What settings do you use? Those kinds of things.
> I usually use the cold water.
> Why do you use the cold water setting?
> To save propane.
>
> Jackie, Feb 26, 2013

> How about your laundry? How do you do your laundry?
> In cold water.

Marge, Feb 21, 2013

When I ask people how they do their laundry, I ask them how often they do it, how many loads they do in a week, what settings they use on the machine, how they dry their clothes.... Most consistently, and often as first description of how they do laundry, I am told that they do it in cold water, as the interview segments above demonstrate (survey says 78% of households in Tsay Keh Always (63%) or Usually (15%) do their laundry in cold water). People answer the other parts of that question too, but the fact that they wash their laundry in cold water is one that both they and I want to stress.

As Figure 4.2, above, illustrates, the majority of water heaters in Tsay Keh use propane as heating fuel. In fact, the shift to electric water heaters is a more recent one, so that from 1990 until quite recently (2010) nearly all water heaters in the village relied on propane. The pathways of access to propane for households, as summarized in Table 4.2, in all cases but that of the elder residences, involve a direct market exchange either via larger, less-frequent deliveries from Superior Propane or the frequent purchase of propane in the smaller 100lb tanks.

Households have, therefore, been responsible for the procurement of their propane, which they have done through market interactions. Households paying for their own propane, spend, on average, about $100 per month on propane (see Figure 4.3). It's important to note, all but one data point in this figure represent households whose main source of heating is not propane. In other words, this average monthly expenditure on propane, almost exclusively reflects the use of propane for hot water and to a lesser extent cooking (50% of these households use propane as their cooking fuel).

Given the cost, and the fact that propane is most commonly used in activities that require hot water, many of Tsay Keh's households go to great lengths to economize and emphasize this economizing of their propane supply in their laundry routines (and bathing practices). When I ask why they do their laundry in cold water, for example, I predominantly get answers that stress "saving" propane, or as Angela puts it "so we can have more showers or baths" (Jason and Angela, Feb 18, 2013). They emphasize, as the examples in Table 4.4, illustrate, "saving", "not paying [more]" and "not wasting" propane and/or hot water consistently. In this emphasis on economizing, there is the implication of a compromise: People don't do laundry in cold water because they want to, or because that's just how you do laundry, but rather because they find paying for propane a financial burden and want to minimize this burden, or as Angela goes on to say to "stretch our hot water more" (Jason and Angela, Feb 18, 2013).

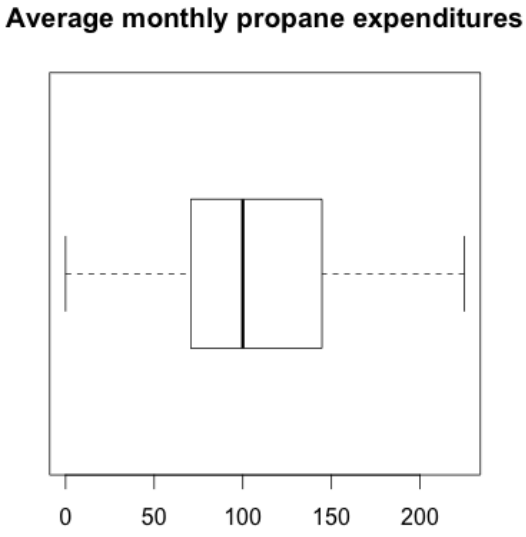

Figure 4.3: Monthly propane costs

This compromise is certainly more strongly felt by households that find the cost of propane prohibitive to keeping up with regular payments. About a quarter of interview participants, in fact, described frequent periods of having to go without propane. In such cases, using cold water is explicitly talked about as a compromise, as this segment from an interview, illustrates:

> How about your water temperature? Is that cold, warm, hot?
> Well, I'd like to have it warm because you know, kids play around, they need to have . . . [trails off]. Now I've got no propane, so it's all cold.
> Yeah?
> Yeah. It's not bad because the snow's still up, but when the snow melts it gets yucky outside, then I really need to use more [hot] water to do their clothes.
>
> Laura, Feb 25, 2013

Making compromises on desired levels of cleanliness, however, is often not just a compromise on cleanliness, but, particularly for households with children, is tied up in social norms. Failing their observation can result in stigma around parenting. Parents who live with stigma around having kids that aren't "clean" are then forced into a redoubling of efforts in the maintenance of cleanliness and the impression of cleanliness of their kids in the community. As a woman who faces this stigma in Tsay Keh explains her washing routine to me, below, for example, she is engaged in not just a description of

Table 4.4: Examples of how people explain their use of cold water for laundry as means of economizing the use of propane

Interview Segment	Interviewee and date
Um, and what settings do you use on the washing machine? Cold water. Yeah. Cold? Why is that? Uh, so I don't have to pay for propane.	Dora & Tim, Feb 19, 2013
Um, what cycle do you use on the washing machine? Just regular. Just regular? And what temperature for the water? Cold water always. Why is that? Wouldn't want to waste energy for the hot.	Mark, Feb 19, 2013
Um, what setting do you use for your laundry? Cold. Cold? And like regular, gentle Regular. Why regular and why cold? Well, cold saves hot water. Yeah. And I don't know, just the way I was taught I guess.	Lauren, Feb 19, 2013
What setting do you use on your washing machine? I use cold. Cold water? Why is that? Because um, because we only have our hot water tank for washing the dishes.	Jane, Feb 25, 2013
And why do you use the cold one, otherwise? It'll save waterand the heating bill. And the propane there.	Steven, Feb 20, 2013

how she performs her laundry practices, but a performance of addressing this stigma by emphasizing how hard she works at cleaning her house "for [her] children". What's not said here is that even before I entered her house to interview her, I had heard all kinds of whispers about this woman's children having hygiene 'issues.' Her performance of stressing her cleaning routine to me and my community research assistant is, implicitly, a way of addressing this stigma:

> What settings do you use on your washing machine?
> Extra wash.
> You do the extra wash? Why is that?
> Um, cause some of the kids' clothes are far too dirty. Or they, you know, they like to crawl around at the gym, or do this or that, or go sliding at sliding hill. I need to make sure things are clean. 'Cause they have a history of super nits or bugs or whatever. I have to do blankets with hot water, and you know, really do disinfect my house because that's going round at the school, right? With the head lice, and the infantigo, and stuff, I have to keep my place

clean 24/7 for my kids.

Clarissa, Feb 26, 2013

Stigmas of this sort prohibit full participation of those who suffer from them in the life of their communities. Often people are not granted the same dignity and respect as others, and this, as I discussed in the Theory chapter, has important implications for questions of both recognition and procedural justice as features of energy poverty. Energy poverty, in this sense, is firstly a matter of redistribution of access to energy resources, but is also a matter of addressing the recognition-based injustices that lack of access to resources creates. Paying attention to places of compromise in desired qualities such as comfort, convenience, and cleanliness (what Wilhite et al (2003) refer to as meta energy services) in performing activities that consume energy, reveals norms of what successful performances of these activities should look like and processes that normalize new forms of demand. It also allows for investigating the ways in which the daily lives of those who struggle with securing access to ingredients of practices are affected.

While compromises in how practitioners prefer to perform practices and associated stigmas when practitioners fail in their performances are certainly the most relevant to the question of how energy vulnerabilities are experienced at home, there is a second kind of answer to the question of why people do laundry in cold water that I would like to discuss. Here people give no economizing rationale for doing laundry in cold water, but rather explain it as something they have always done and often go no deeper into why it might be something that they have always done. This kind of answer sheds light on one process through which new ways of doing things (including things that may have been seen as an undesired compromise at first) can become normalized in performances of a practice. The examples in Table 4.5, below, illustrate how these kinds of answers invoke a sense of normality around the use of cold water for laundry, where any implication of a compromise in doing so has long since vanished.

It might be interesting to note that these latter kinds of responses often came from younger participants, who might have grown up with cold water as the "normal" kind of water used for doing laundry. Many of them, including three of the example cited in Table 4.5, above, (19, 12 and 29), live in all-electric homes now and have no monetary reason for economizing on their hot water use. Similar to their propane-using neighbours, these households continue to do their laundry in cold water, but unlike them, imply no sense of it being a compromise. As Figure 4.4, below, suggests there is a generational trend in hot water use among households: Older interview participants mentioned using hot or warm

Table 4.5: Examples of people invoking habits and normality as explanation for doing laundry in cold water

Interview Segment	Interviewee and date
I just use normal and cold water. And why is that? Ummm, I don't know. I always wash my clothes in cold water. You've always done that? Yeah, 'cause my stepmother said using hot water just cooks the stains in the clothes.	Janet, Feb 23, 2013
How about your laundry? How do you do your laundry? In cold water. In cold water? Why is that? Just do. Again? [laugh] never thought about it? Is it how you were taught? I don't know. It's just natural, I guess. Always.	Marge, Feb 21, 2013
Um, what about the water? Is it warm or cold or warm and cold? It's cold. It's cold? Why do you do cold water? Because I have those cold kind of laundry soap that washes in cold.	Ashlee, Feb 22, 2013
what settings do you use on the washing machine? I use cold water. You use cold water? Why is that? Um. I don't know. I just . . . cause I'm scared my clothes will shrink? [laughs]	Karly and Jack, Feb 26, 2013
What settings do you use on your washing machine? Cold. Cold? Why is that? I don't know. Got so used to using cold. Rarely use any hot water for our wash. Just cold.	Mary, Feb 28, 2013

water, often suggesting that things wouldn't get clean otherwise. Most middle-aged participants use cold water, but invoke an economizing rationale that emphasizes it being a compromise of how they would prefer to do laundry. Many of the younger participants, on the other hand, seem to have taken up the habit of doing laundry in cold water, find it an adequate way of doing laundry and even in the absence of the monetary imperative, continue to do so.

This generational trend is, however, worthy of further exploration in the context of Tsay Keh's particular arrangement for energy provision. Given that elders don't pay for their propane use and everyone receives free electricity, the two groups of elders and those who live in homes with all-electric appliances (primarily newer homes, often occupied by younger families) present interesting points of

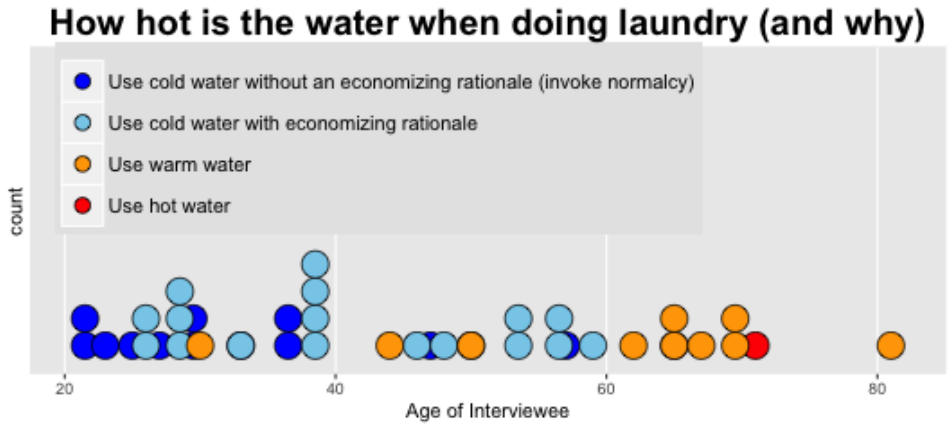

Figure 4.4: Water temperature and the rationale for its use by age

comparison in this regard, as they both effectively have access to free hot water. In Figure 4.5, below, I have split the data from the Figure 4.4 into two categories of those who have access to free hot water and those who pay for heating their water. This Figure further illuminates two observations already alluded to: Firstly, that the relationships of access to the materials of practice (propane in this case) very much influence the meanings attributed to those materials and subsequently how they are used in practices. In this case, as the top panel in the figure illustrates, most of the people who pay for heating their water not only use cold water for their laundry, but do so with an economizing rationale that emphasizes savings (of mostly money, but sometimes propane itself, as well). When the relationships of access to ingredients of a practice is an economic one, and one that practitioners find economically burdensome, the performance of this practice can reflect this vulnerability in moments of compromise from desired qualities of comfort, convenience and /or cleanliness.

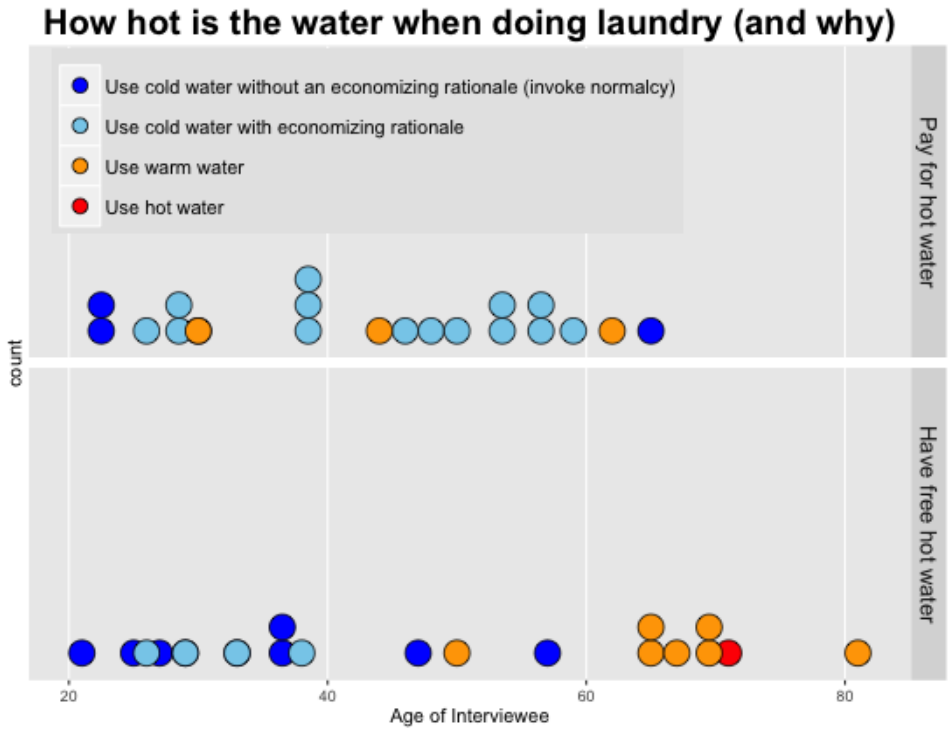

Figure 4.5: Water temperature and the rationale for its use by age and pathway of access to hot water

The second observation reinforced by Figure 4.5 is the persistence of the cohort effect as something additional to the effects of the relationships of access. As the second panel in this figure illustrates, among households that have access to free hot water, and are therefore not bound by the economic relationships of access, there is a clear difference between older and younger households: While all interview participants under the age of 40 use cold water for laundry, all of those over 60 use warm water. There are very few middle-aged participants who have free hot water access due to Tsay Keh's particular pattern of housing development and energy provision policies. However, the economizing behaviour of this cohort seems to translate to more habitual behaviour among the younger cohort. The feeling of compromise inherent in the economizing rationale of those whose access to propane is secured through a direct market transaction disappears to a certain extent among these younger participants, while the performances of doing laundry remain remarkably similar. There are, of course, those who invoke an economizing rationale for doing laundry in cold water even as they have access to free hot

water. This group is predominately composed of those who want to save propane as a resource about which wastefulness is seen as irresponsible.

4.5.2 Heating their homes

The actions and activities involved in the maintenance of a thermally comfortable home form another constellation of practices of particular interest to discussions of energy access. The potential for adverse human health impacts associated with the inability to maintain a thermally comfortable environment has, in fact, made it a prime area of focus in the literature on energy poverty. This emphasis has contributed greatly to the establishment of the link between energy poverty and the experience of feeling cold at home, such that when subjective measures of energy poverty are used as indicators for the experience in studies of energy poverty, the (in)ability to maintain thermal comfort in winter is always included as one of a handful of subjective indicators, if not the only one.

In Tsay Keh, households attain thermal comfort through a careful and complex set of practices involving multiple energy carriers. Most Tsay Keh homes built earlier than 2010 are equipped with dual propane/wood furnaces. The newer homes, built in the past 5 years, all have baseboard electric heating and wood stoves. There are, therefore, multiple combinations of wood stove, propane stove, baseboard electric and electric plug-in heating used in achieving thermal comfort. In fact, most homes use more than one source of heat: Thirty three out of the 42 households interviewed (about 80%), reported using at least two different modes of heating in their homes on a regular basis. Nine of these households (about 20% of all households) reported using three modes of heating.

Deciding on which mode of heating to use for households with access to more than one mode of heating involves a complex calculus of trade offs between costs, convenience and comfort, as these three energy carriers and their associated modes of heating are secured for home heating practices through pathways involving various degrees of physical effort and financial expense while resulting in qualitatively different heat, both with regards to temperatures achieved and other aesthetic qualities of the experience.

As Figure 4.1, earlier in this chapter demonstrated, the majority of Tsay Keh households (70%) use wood as their main source of heating furthermore, 86% of the households use wood either as their primary or secondary modes of heating. The practices of wood collection and burning, therefore, form important parts of the constellation of practices dedicated to maintaining thermal comfort at home.

Much of this section, therefore, will be a discussion of the use of wood heat, alone or in combination with other modes of heating and its implications for the experience of energy vulnerability at home.

A preference for wood

> Do you have a preference for wood heat or propane if you could choose?
> prefer wood heat.
> Why is that?
> Well, it makes so much more sense. We live in the middle of a forest. So why buy propane? Makes no sense whatsoever. And [. . .] propane heat gives me a nosebleed.
>
> Roger, Feb 22, 2013

Discussions of different modes of household heating in Tsay Keh often revolved around the financially burdensome procurement of propane, the ease of use of electric baseboard heating, lingering concerns about the safety of electric plug-in heaters and a preference for wood, both in terms of its aesthetic qualities, and for its contribution to the energy security of households within the community. Table 4.6, below, summarizes some of the reasons interview participants gave for preferring wood over propane or electric heat. Of course, this table does not reflect the fact that there wasn't unanimous preference for wood over all other options: While nearly everyone expressed a preference for wood over propane, some expressed a preference for electric heat, for its convenience (ease of use, free of charge and requiring no maintenance).

In addition to its aesthetic qualities, wood contributes to households' energy security by virtue of the fact that it is reliable and allows an independence from the costly propane. As Lauren explains, wood's place outside of the market system enables the continued attainment of thermal comfort for everyone in the village, including those who do not /cannot participate in the labour market:

> I prefer wood stove.
> Why is that?
> Because it's more better than propane . . . because some of us don't have jobs to buy propane.
> Yeah. And at least a wood stove you can go out and cut your own wood to heat your home, right? So I'd say wood stove would be better for everybody.
>
> Lauren, Feb 19, 2013

Tsay Keh's forests are part of the commons to which all community members have access. This is not to say that there isn't commercial forestry interest in the territory. In fact, the Tsay Keh Dene

Table 4.6: Examples of reasons for preferring wood heat

Interview Segment	Interviewee and date
Quality of heat	
Um, so do you prefer propane heat or wood heat? Wood heat. Yeah? Why is that? Because I think it's, it's more comfortable, more warmer. And it's, um, I'm used to wood heat, actually.	Jane, Feb 25, 2013
Okay, I forgot to ask you, you said you prefer wood, if you had a wood stove, right? what do you like about wood? It's just better heat than propane. Propane's got dry heat. And my little grandson, from that heat, he gets bleeding nose. Too dry.	Mary, Feb 28, 2013
Propane is too expensive	
So you have a wood furnace down here. And a furnace— propane furnace? Um, which one do you use more? The wood. The wood? And why is that? Can't afford propane.	Dorothy, Feb 22, 2013
Why do you prefer the wood over propane furnace? Cause it saves propane [. . .] The reason why we don't use propane is because it burns fast. Oh yeah? And it costs a lot to get propane. So it saves a lot of propane for us during these winter months and the summer months.	George, Feb 22, 2013
How do you heat the house? Wood heat. And when it's too cold we use, sometimes, use [the propane] furnace, but mostly never. Cause my father in law makes sure we have wood — it costs us way too much for propane. My mother in law and my father in law had to help out, help us out twice with propane, and it costs 750, at least to keep propane in there for 3 months.	Clarissa, Feb 26, 2013
Reliability	
Yeah. Um, when it comes to heat, do you prefer electric heating or wood heat? Wood heat. Why is that? Oh you know, you can make a lot of wood and [it's] *reliable*.	Jackie, Feb 26, 2013

Nation operates a forestry enterprise and maintains a forest licence and forest stewardship plans for the commercial forestry practices of the nation. Community members, however, have access to Tsay Keh's traditional territory for hunting, fishing, gathering and other traditional practices.

In the case of Tsay Keh, accessing communal woods is done by individuals and families collecting wood for their heating practices, as well as by the community on behalf of those who cannot collect their own wood. As I've mentioned before, the nation's elected government operates a program employing individuals to collect wood for community elders and others with mobility issues. In the course of my interviews, I learnt that those that are able, both in terms of physical fitness and access to means of transportation, collect their own wood, sometimes as family outings involving the whole family with picnics and snacks and at other times in groups of two or three adults. Elders often mentioned relying on the 'band program' as well as family support and their own collection from nearby areas. Those who didn't have access to a truck, often mentioned relying on family and emphasized the added burden of this.

Tsay Keh households, therefore, have access to wood for their heating needs — though this access is not necessarily an easy one. Not only is wood collection physically demanding and time consuming, it is also not exactly 'free'. Many of the individuals participating in my interviews often objected to that characterization by mentioning the cost of gas for their vehicles, and fuels and oil for their chainsaws, as well as other incidentals:

> And it doesn't cost you anything other than the time, right?
> She [outraged]: Of course it costs a lot.
> He: Just our time.
> Other than the time?
> She: I do buy some snacks. like $100 . . .
> He: Well, that's not included. That's our own doing though.
> She: Yeah, but, snacks. That's only hot dogs, bread, ketchup, juice boxes. That was a hundred dollars. Plus our gas. Probably about half a tank.
> He: we make an event out of it. So.
> She: Half a tank. So, it's about fifty dollars in gas.
>
> Jason and Angela, Feb 18, 2013

> You gotta think about fuel for your truck, you've gotta think about fuel for your saw, and not only- with power saw you need to mix the gas, right? So you need to put oil, you need to buy two separate oils, one is called mixing oil that you have to pour into the gas can, so you're buying gas and mixing oil [. . .]
>
> Sarah, Feb 25, 2013

Accessing wood through the community program is also not without challenges, in terms of getting wood that is the right size or enough:

> Do people bring you wood or do you collect your own?
> Well, the band usually brings.
> The band brings the wood, eh? That's great.
> Yeah, last time they brought me not even a full load of wood [...] there's times they bring long wood, when I tell them [we've] got a small stove.
>
> Isaac, Feb 25, 2013

What's worth stressing, however, is that despite its challenges, there are pathways of access for all community members. Some of these paths are more self-reliant while others require reliance on family members, for their physical help, or the lending of trucks or chainsaws, or on the community wood collection program. In this context, not only are the woods, themselves, part of the commons, but the labour involved in their collection and transformation into fuel becomes part of this commons, making the commons an enactment of social relationships and obligations towards family and other relations.

Wood as an ingredient to the practice of maintaining thermal comfort, therefore, is brought into the practice by virtue of its status as part of the commons, and through the existence of social practices of its collection, which ensure access to wood regardless of ability and mobility. Wood heat, then, becomes a reliable and accessible form of heating, which is then supplemented with other modes of heating to achieve the desired level of thermal comfort.

Wood in Tsay Keh is often supplemented by electric plug-in heaters to heat rooms that never get quite warm enough or to heat the living room when it's not nearly cold enough for the wood stove. Wood is also supplemented by propane, using the thermostatically controlled furnace, during the night, to keep warm when the wood fire dies out or when household inhabitants are away for a few days to prevent the house and pipes from freezing in the winter. The latter set of practices, of course, take advantage of the convenience of thermostatic control to maintain comfort when the constant tending to the fire required for operating a wood stove is not practical. It is through these supplementary heating practices built around the use of wood that Tsay Keh households attempt to achieve thermal comfort and as the following section demonstrates, succeed in doing so.

Nobody's cold: subjective and "objective" assessments of thermal comfort

As I have argued so far, the existence of wood outside of the market system and its place as commons (including familial and communal labour associated with its collection) enables pathways of access for all members of the community regardless of affluence, ability or mobility. This access provides not only a reliable and worry-free source of heat, but also enables the maintenance of subjectively comfortable homes in the sub-zero winters: When I asked people in Tsay Keh how often, in winter, they felt like their homes were warm enough, nearly 90% of them said that they were always or usually warm enough. Furthermore, no one chose the rarely or never options of this survey question. As a point of comparison, when I ask the same question in Musqueam, with a much warmer winter (see chapter 6), 72% say the same, while 5% choose the rarely or never options.

It is often quoted that WHO recommends a temperature of 21C in the main living area and 18C in the bedrooms (Hills, 2012). These numbers are widely criticized for their basis in outdated reports and lack of correspondence with field reports of temperatures at which people report being comfortable (Shove, 2003). In Tsay Keh, I left a thermometer in the interviewee's living rooms which records minimum and maximum temperatures over the course of a 24-hour period. I returned a day after each interview and recorded these values. In Figure 4.6, below, I have plotted ratings of thermal comfort against the range of temperature households experienced in late February and early March of 2013.

In addition to the fact that most Tsay Keh households are able to attain thermal comfort, there are two observations to be made from this figure: Firstly, it is not uncommon for households to experience large variations in temperature during the course of the day, especially when using wood stoves. This is expected, of course, as fires die out in the night allowing temperatures to drop. However, despite these large variations, as I've already mentioned, 90% of the households find their homes always or usually warm enough in winter.

Secondly, living room temperatures seem to be considerably higher in Tsay Keh than the recommended WHO temperature of 21 degrees. This might be attributed to the use of wood stoves and the inability to finely control the temperature in the house, however, the electrically heated homes seem to favour these higher temperatures as well. Given the recency of electric heating in Tsay Keh, perhaps, this observation can be thought of as another example of habits, preferences and practices developed in one setting and transferred to and maintained in another, even when the original impetus for the forma-

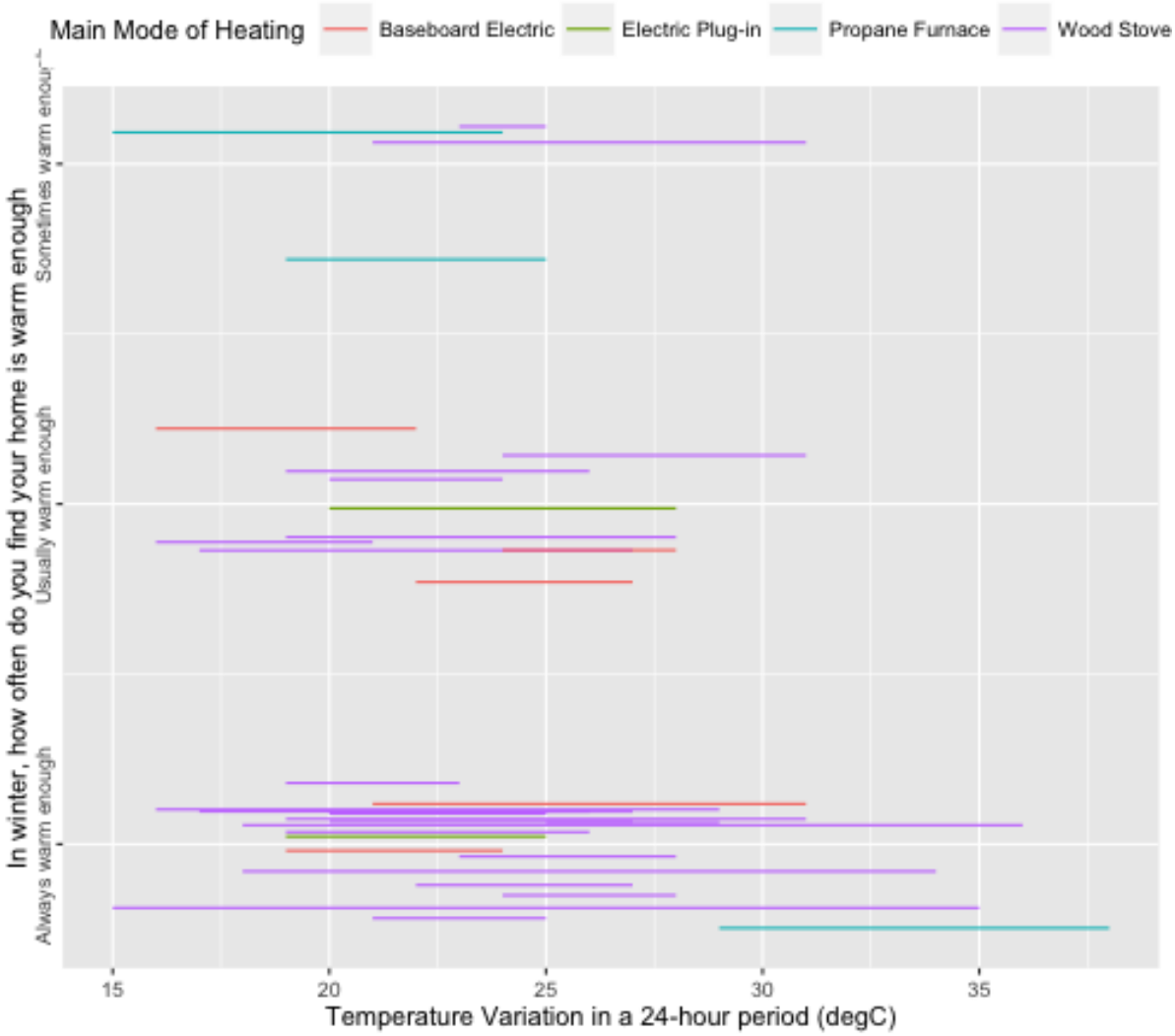

Figure 4.6: Subjective ratings of thermal comfort vs. living room temperature

tion of those habits and preferences are removed. As was the case with the use of cold water in laundry practices of younger households, the preference for warmer indoor temperatures, which were a feature of wood heating, seem to be continuing in electrically heated homes.

In short, the constellation of practices performed with the aim of maintaining thermal comfort, involves a complex calculus taking into account compromises between cost, convenience, comfort and reliability. However, despite the fact that many of the Tsay Keh houses have poor insulation (particularly for the climate), an overwhelming majority of residents manage to stay warm and comfortable. Investigating the pathways of access to the different ingredients of the constellation of practices that keep homes warm sheds light on how this is possible, given the climate, the poor thermal performance

of the housing units, and the cost of propane. The place of wood, and often the labour that goes into its collection, outside of the market system facilitates access for nearly everyone in the village. This alternative pathway of access makes the experience of energy poverty markedly different from its counterparts in urban settings (see chapter 6) or rural ones lacking community arrangements for securing access to wood by those with mobility challenges.

4.5.3 The third ingredient: electricity

This discussion of the practices of maintaining thermal comfort and doing laundry has highlighted relationships with ingredients of practice that are rooted in the relationships of access to those ingredients. Economizing behaviour and logics are used both in relation to use of propane for hot water in laundry routines and in the use of propane for heating. Propane, of course, is the only ingredient of practice (among energy carriers) that is procured directly by households through market exchange. The economizing behaviour with regards to its use, therefore, can be thought of as a reflection of this mode of access. Household practices that rely on this ingredient, especially those that by virtue of their reliance on specific infrastructures of practice (e.g. furnaces, hot water heaters) offer no flexibility in terms of substitution of other energy carriers, then, reflect a precariousness of access. For example, while in most cases Tsay Keh households have an alternative to propane for space heating needs, many don't have an alternative for their water heating needs and continue to use cold water, and do so with a sense of compromise and an economizing rationale. When it comes to laundry practices, therefore, households, particularly middle aged ones, feel a degree of compromise in meeting their needs. The reliance on wood-heating in the practice of thermal comfort maintenance, on the other hand, largely improves the households sense of energy security. As I have suggested, wood's place as part of the commons, both in terms of the woods themselves and the labour required to transform them to fuel, enables pathways of access to this ingredient of practice that ensures successful performances of home heating practices for nearly everyone in the village.

My discussion of laundry and space-heating practices of Tsay Keh households has also alluded to the ways in which electricity, as an ingredient of practice, enters these practices. In the discussion around laundry, I've suggested that the recent use of electric water heaters creates an easing of the sense of compromise around having to do laundry in cold water. Likewise, the use of electricity in space heating practices was characterized by the infrastructures enabling its use: Those whose houses were equipped

with baseboard electric heaters, continuously emphasized the convenience of using them (both in terms of labour saving and thermostatic control), while those who used electric plug-in heaters described their use in a supplementary sense, as means of regulating indoor temperature on warmer days that did not quite warrant the use of wood stoves or as an additional mode of heating on very cold days when the wood stove could not keep their homes at a comfortable temperature. In both cases, however, electricity was talked about as an ingredient of practice to which access was not hindered by affordability. The relationships with this ingredient of practice, in the practices of home heating and laundry seems to be somewhat ambivalent in the sense that economizing rationales and a taken-for-grantedness of access are present in discussions simultaneously. This section breaks from the discussion organized by practices to explicate this ambivalent relationship with this third ingredient of household practices that use energy.

The use of electricity in various diffuse energy using practices of home maintenance (lighting, cleaning, cooking, watching TV, playing video games) occupies a space somewhere between that of the other two energy carriers discussed. While households in Tsay Keh do not receive bills or pay for their electricity use, they are aware of the fact that their government is billed for and pays for everyone's electricity use. As such, electricity is not quite a part of the commons, in the sense that it is still procured through a series of financial transactions, albeit, ones that the households (i.e. users) do not directly participate in. In other words, the financial transaction part of the chains of access is mediated through the government entity, which represents community's interests. Electricity, as an ingredient of practice, therefore, is brought into household practices through pathways of access that combine elements of community membership and market exchange relationships. Tsay Keh households, therefore, talk about electricity use (in the context of thermal comfort maintenance and laundry practices) in ways that invoke both sets of relationships.

In my interviews, households expand on their relationship with this ingredient of practice when I ask them how and why they try to save electricity (if they have indicated that they do) or when I ask follow-up questions on why they think saving electricity will benefit the community as a whole (survey question). It is in these discussions that the sense of ambivalence invoked in the earlier discussions of specific practices are expounded upon and the presence of both communal relationships and economic ones to this ingredient of practice is clarified. For example, Figure 4.7, below, summarizes the different rationales invoked in the discussions on why households save electricity or why they consider doing so good for the community. The colours represent whether these invocations are economic or

communitarian ones (or neither).

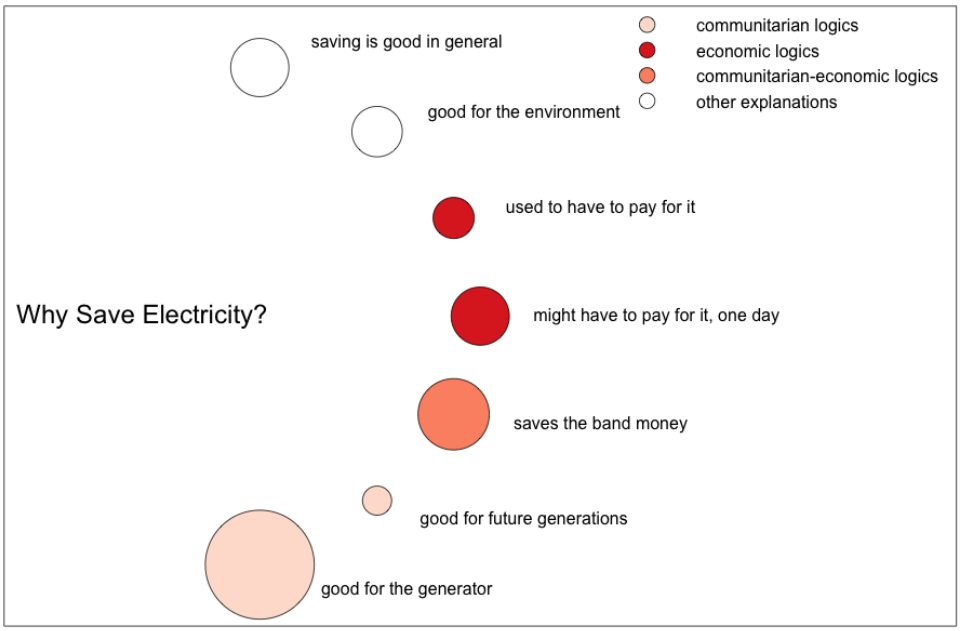

Figure 4.7: Reasons given for saving electricity

Many invoked communitarian rationales, primarily emphasizing that using less electricity at home is good for the community generator (at the time owned by the community), both in terms of extending the life of it and in having fewer power outages. Others invoked communitarian-economic logics that showed awareness of the fact that electricity was an "expense to the band and the money [saved] could go somewhere else" if households were to reduce their electricity use (Michelle, Mar 1, 2013). However, economic rationales invoked for saving electricity were not limited to communitarian ones.

There were two kinds of non-communitarian economic logics used in explaining why households might save electricity. Both are interesting and illuminating for different reasons, so I will spend some time exploring them in the context of Tsay Keh's power provision history (and perceived future). The first class of economic reasons for saving electricity not pertaining to the potential for reducing community expenses are those that I have coded under "might have to pay for it, one day." During the course of the interviews, I learnt that there is a perception among households that their current arrangement for payment for electricity might soon come to an end. Several households indicated expecting that they

might have to pay for their own electricity use, and suggested that they should start practicing electricity conservation in preparation and as practice for this change:

> Do you ever try to save power around the house?
> Yeah. Night-time I shut down everything. No lights. Shut them down [...].
> Why do you try to save power?
> Well, If they start charging us for power we're going to need to know how much I could save.
>
> James, Feb 26, 2013

> Do you ever try to save [electricity] around the house?
> No, I never tried that yet.
> No?
> I just buy bulbs, put them there, as long as it shows light it's good. But now I know I've gotta pay [for] power, so I got to get power smart around here.
>
> Laura, Feb 25, 2013

There are several reasons why this perception might have emerged: Firstly, at the time of the interviews the community was involved in the negotiations around the Remote Community Electrification (RCE) Program, which was due to transfer ownership of community generation assets and the responsibility for power provision to BC Hydro (see the following chapter, for more on this). A change in arrangements for power provision was, therefore, actually in the works for the community. Furthermore, as part of the RCE program, BC Hydro was involved in upgrading the distribution system in the community and installing new meters. Households suspected that this change in responsibility for power provision might entail a change in responsibility for payment as well— though in reality the agreement with BC Hydro was such that decisions on responsibility for payment was left with the nation's elected government, and the previous arrangement remained unchanged.

Secondly, there was a sense on the part of the community government that payment for community electricity was becoming a growing burden. When I spoke with Chief Dennis Izony on Feburary 27th, 2013, he explained that the community had built 6 new residences in the past year and planned on building 14 more that year. Given that new houses in Tsay Keh were all-electric, the chief saw the demand for electricity growing dramatically — and with it the cost to the community. When I asked, explicitly, whether this concern meant that households were going to start receiving bills for electricity use, Chief Izony said "no", but that some form of monthly payments, not directly linked with consumption but based on average community usage and taking account of households' previous electricity use

was more appropriate and something that they were considering. Furthermore, in the context of these intentions and planned changes, the very fact that I was there, asking questions about household energy using practices probably contributed to the perception that something was up and amplified the anxieties around this possibility. So, while in many of the home maintenance practices of Tsay Keh, electricity is taken for granted as an ingredient of practice, there are anxieties around the commercialization of this relationship.

I have coded the second class of economic logics invoked with regards to the use of electricity under "used to have to pay for it." In this type of statement, people suggested that they practiced electricity conservation, because at some point in their lives, they had accessed electricity under different access regimes. Often, they said that they had "lived in town" and were used to receiving bills from BC Hydro for their electricity use. These interviewees seemed to suggest that economizing on an ingredient of practice that enters practices through market exchange (particularly when this transaction is burdensome) is a 'natural' thing to do:

> Do you ever hang dry anything?
> When the weather calls for it. Or the season. [laughs]
> So in the summer you
> Yeah.
> So, why do you do that?
> Save on energy. I'm energy conscientious.
> Oh, you are?
> Yeah. cause I used to live in Makenzie — Mackenzie and Prince George, so I got Telus bills, phone bills, electric bills, heat bills. So yeah
>
> Hannah, Feb 20, 2013

Furthermore, the idea that one learns how to 'save' energy, when one has to pay for it, was suggested both by those who had lived in town and those who hadn't:

> What do you think people that use up a lot of power do that uses up so much electricity?
> Samantha: Well, some people that never have electricity in their life, that's them that, oh, even right now, some of them, they have their Christmas lights still on.
> Alec: Yeah.
> Why is that?
> Samantha: But then they learn about electricity and how they pay for electricity and how much it costs. Uncle used to stay out there in Summit Lake and he knows about power and stuff like that.
> Yeah?

> Samantha: So he knows, and that's the reason why he's, he knows how to take shortcuts. See he even buys those
> Yeah? he buys those CFL kind [of light bulbs]? Did you use to have to pay for electricity before?
> Samantha [to Alec]: When you guys lived in Summit Lake?
> Alec:Yeah. Parsnip too.
> Samantha: Oh yeah, there too?
> Alec: Yeah.
> Samantha: They used to have a reserve in Parsnip. They used to have electricity there too and some people paid. Some of them know the score. But them like me who lived in a bush, born in a bush and stayed in a bush, that's us that that use power. Oh, Power! Suddenly we used curling iron, blow dryer, everything [laughs]. That's right.
>
> Alec and Samantha, Feb 21, 2013

So with regards to electricity use, as with propane and wood, two kinds of processes seem to shape the nature of the relationship with this ingredient of practice: firstly those predicated on the pathways of access to it, and secondly previous experiences with those pathways of access.

4.6 Vulnerability, resilience and living with precariousness: lessons from Tsay Keh

I've had two main goals in this chapter; firstly to develop the theoretical language that enables talking about 'access' to the material arrangements of practice (and showing that these relations of access shape the performances of practices) and secondly to demonstrate the ways in which households in Tsay Keh experience energy vulnerability/poverty in the mundane moments of home maintenance practices and the ways in which they manage these moments of vulnerability.

With regards to the theoretical argument, I have demonstrated that the relationships of access to the energy carriers that are the ingredients of practice in home maintenance practices of Tsay Keh can be characterized as purely economic, communitarian and as a hybrid of the two. Challenges in access, anxieties and vulnerabilities are encountered across all three sets of relationships — however, unsurprisingly, these challenges are most acute in cases where households directly participate in market exchange relationships (particularly lack of access to labour markets) and when the particular ingredient of practice and the sets of relationships that they are a part of cannot be replaced by other ingredients enmeshed in other relationships of access.

Most Tsay Keh households have access to multiple energy carriers, and in the case of many practices, have the capacity to use different energy carriers for achieving more or less the same objectives.

The discussion around thermal comfort maintenance practices most clearly demonstrated the use of multiple ingredients and infrastructures in space heating practices. In this case, however, the main set of practices involved in meeting thermal comfort needs revolved around the use of wood, which due to its place outside of the market and as part of the commons enhances households' energy security. The use of other energy carriers in the practices of space heating, therefore, was largely not for the sake of managing access challenges. Electricity and propane for space heating were used to fine-tune the degree of thermal comfort and/or to take advantage of the conveniences offered by these energy carriers (thermostatic control, lack of physical effort required in maintaining comfort). In the case of practices in which the most common avenue for successful performance required the use of ingredients with challenging pathways of access, Tsay Keh households use alternative ingredients and infrastructures engendering different relationships of access to achieve similar objectives. For example, households that have propane stoves and struggle with securing access to propane on a regular basis, often talked about using electric skillets for cooking, to preserve their propane supply for practices that offered no substitutability of ingredients or to manage interruptions in supply:

> You told me that you had an [] electric skillet. Do you use that only when your propane is out?
> I try to use it even when I do have propane to try and save propane. We do our best to save as much propane as we can. Yeah. [. . .]
> Do you ever have to go without propane?
> Yes.
> How often does that happen?
> Oh my goodness, maybe once a month.
> Once a month? and how long would you have to go without?
> Two-three days.
> Yeah? what do you do when that happens?
> Ummm, I usually try and use my electric frying pan and my roaster for cooking, but when it comes down to the dishes it's kind of tough. I usually microwave hot water, use my coffee pot and I have a little tiny hot water kettle, electric. so I have all three going to make water for dishes.
>
> Alyssa, Mar 1, 2013

When ingredients of practices are substituted, as is the case with electricity (and the electric skillet) for propane (and propane stove) in practices (such as cooking) a different set of relationships are brought into practice. In this case, the economizing rationale of propane use is replaced by the ambivalence and taken-for-grantedness of electricity in performances that sacrifice the convenience of using the intended

infrastructures but offer a lifeline to the continued performance of essential practices. Where wood is used instead of the propane furnaces, a similar thing occurs: the strictly economic relationship of the pathway of access to propane is replaced by the communitarian relationships of accessing the commons. Therefore, substitutions of ingredients of practice in Tsay Keh, happen in the context of managing vulnerabilities, primarily to swap one set of relationships of access for another, less challenging one. However, when the economic relationship is inescapable, the precariousness of access is manifested in practice through compromises in comfort, convenience or cleanliness. In Tsay Keh, this compromise was most clearly articulated by households when discussing how they do dishes when they're out of propane, or in their laundry routines in which they emphasize having to compromise on a desired idea of 'cleanliness' in favour of spending less money on propane.

It is also important to note that the swapping out of one set of relationships for another with regards to access to ingredients of home maintenance practices doesn't just happen preventatively, before an interruption in access occurs, but also remedially, after an interruption has occurred. While households substitute ingredients of practice wherever possible to prevent running out of propane before they have the money to buy more, many still run out of propane on a regular basis (about a quarter, as I mentioned earlier). When households run out of propane, household practices that rely on this ingredient take new forms, some involving the leveraging of familial relationships, as these interview segments illustrate:

> Do you ever have to go without propane?
> Um, right now, I don't have propane, because I don't have no money to get any, so.
> So what kinds of things —what do you do differently?
> I just heat water on my electric stove.
> That's for like showers, eh?
> Well, yeah, I'll just go to my mom's and take my shower.
> You go .... And you heat water for ...?
> Doing the dishes.
> Doing the dishes.
> Yeah. I did have money, but not enough to go around.
>
> Malcolm, Feb 25, 2013

> Have you ever had to go without propane?
> Oh, all the time.
> Yeah? How often does that happen?
> Uh, right now I'm out of propane, so, so just heating our water for washing dishes and things like that.
> What about for showers? What do you do for those?
> Uh, go over to [] my son's.

Jane, Feb 25, 2013

> Have you ever had to go without propane?
> Yes.
> How long does it last when you go without propane? Like what's the longest stretch?
> We usually stay without propane for 2 weeks but we go cook over at my mother in law's.

Clarissa, Feb 26, 2013

Ultimately, what is important to note is Tsay Keh households manage their precarious access to propane by swapping out the economic relationships of its access for the communitarian relationships of accessing wood and electricity. They primarily use wood for heating, forgoing the conveniences of thermostatic control and ease of use, but managing the attainment of thermal comfort nonetheless through a complex performance of supplementation and occasional use of other ingredients. With regards to the use of hot water for laundry, they continue to choose to use cold water instead to preserve their supply for the practices in which no flexibility exist with regards to choice of ingredient and infrastructures. When they finally do run out of propane, they perform practices like doing the dishes by performing deeply inconvenient rituals of heating water in their microwave or kettles, still relying on the availability of other relationships of access, albeit through inconvenient pathways. And finally, for the truly insubstitutable, they take the practice elsewhere in the absence of access to appropriate ingredients: they take showers at their relatives' houses, invoking their social relationships in managing the vulnerabilities of their economic relationships and the infrastructural inflexibilities of access.

In other words, swapping ingredients of practice in Tsay Keh, offers an avenue for meeting the same set of goals, albeit through compromises, by invoking different relationships of access. The resilience of Tsay Keh households with regards to the meeting of energy needs is not simply due to the availability of multiple energy carriers and flexible infrastructures of access, but rather due to the fact that these alternative ingredients are accessed through different relationships of access altogether. For a community where labour market participation is low, and nearly 30% of households live with annual incomes below $25,000, participation in market exchange is challenging, regardless of which energy carrier is procured through this exchange. Of course, the price of energy carriers matters — but in Tsay Keh resilience in meeting household energy needs stems from the existence of the variegated relationships of access and the fact that non-financial relationships of access exist.

In talking about the resilience of Tsay Keh households in terms of meeting their energy needs, I

don't mean to minimize the hardships encountered in this constant set of negotiations and compromises in securing access. The 25% of households in Tsay Keh that face regular periods of disruption to their propane access face extreme hardships in doing the mundane tasks of home maintenance, like cooking without a stove or washing their dishes without hot water. Households with young children struggle with having to boil water to bathe them, and then having to clean the calcium build-up on those pots (Jason and Angela, Feb 18, 2013). And all households that experience frequent disruptions in access to propane have to deal with the psychological stress of the constant threat of running out. But what I hope to emphasize in mentioning the resilience of the community, is to say that the community government recognizes this challenge and continues to try to ease this hardship.

In fact, in talking to Chief Izony, I asked him why the community had changed their housing policy to the all-electric new developments policy. He mentioned the stress and challenge of paying for propane for households as his prime motivation for wanting to reduce dependence on propane. He said that people run out of propane, "can't cook and shower" and that's an "inconvenience." Furthermore, the government considers itself an important mediator of access across all energy carriers for elders, and certainly for electricity for everyone. In choosing to insert itself in market relationships on behalf of households, the nation's government modifies these relationships to more communitarian ones which provide easier pathways of access for households. Even in discussions of changing the billing arrangements, the Chief never suggests completely changing the nature of that relationship — rather he suggests creating a tiered model of access where community members pay for use above a threshold. The active involvement of the community government in managing the precariousness of energy access in Tsay Keh, in the era of neoliberal governance, is indeed unique in many ways, particularly in its insistence on transferring the burden of paying for energy from the household level to the community level.

4.7 Conclusions: energy poverty in Tsay Keh

Throughout this discussion, I've deliberately held off on defining energy poverty at the household level in any specific way. Rather, I've tried to look for its manifestations in household practices that use energy, in moments where a compromise in convenience, cleanliness and comfort occurs. I have largely left it to my interview participants to note moments of compromise, and they have noted several, including compromises in comfort, when waking up to a cold house because the fire has died in the night or compromises in children's cleanliness, its associated stigma and a redoubling of efforts on the part

of these parents in maintaining cleanliness and impressions of cleanliness. Community members in Tsay Keh also repeatedly noted moments of compromise in conveniences of varying significance including the inconvenience of collecting wood, the added inconvenience of collecting wood for those with mobility challenges, the inconvenience and stress of the close management of one's hot water use, the inconvenience of running out of propane and having no hot water, the inconvenience of having to boil water to wash one's dishes, the inconvenience of having to boil water for the family's bath, the inconvenience of removing the calcium build-up from the pans used to boil water for the family's bath, and the inconvenience of having to go to a neighbour or family member's house for a shower.

As I have already discussed, the majority of these moments of compromise in comfort, convenience and cleanliness in Tsay Keh occur around the use of hot water in homes where water is heated with propane, and particularly for folks that find keeping up with propane payments financially burdensome. That incurring these inconveniences on a regular basis amounts to a disproportionately large amount of effort in securing one's access to energy services can objectively be demonstrated by noting that the majority of households, both in Tsay Keh, but also more broadly speaking in British Columbia (or Canada) don't have to go to such extreme lengths to take a shower. As I have already mentioned approximately 25% of Tsay Keh households that participated in my interviews mentioned running out of propane with some regularity. Others, including those that have electric water heating, elders who don't have to pay for propane and those that don't find paying for propane a financial burden, encountered these problems much less frequently, or, in fact, never encountered these problems.

What I'm suggesting is that the experience of precarious energy access, or energy poverty, manifests itself in Tsay Keh households, predominantly in household practices that use hot water, in having to deal with constant outages and struggling to keep up with norms around cleanliness, particularly around presentability of children. What's at stake in the latter case is one's claims to being a good or competent parent. And failing to maintain one's claim to being a good parent brings shame and stigma and necessitates a redoubling of efforts in dispelling this stigma. That is to say that energy poverty certainly amounts to an experience of material hardship in not achieving one's material needs of comfort, but also an experience of social exclusion, when we acknowledge that practices that use energy, like all practices, are fundamentally social entities.

In other words, like poverty, energy poverty matters because it elevates material survival, the meeting of basic needs to the main project of life, while subjecting those who fail to attain the norms of

cleanliness or proper parenting to shame and stigma. Investigating the manifestations of energy poverty in the daily lives of those who might struggle with securing access to energy services enables an understanding of this dimension of the experience and is an important part of explaining just why energy poverty matters. Furthermore, understanding energy poverty as a justice issue requires engaging with justice as recognition, which would necessitate an acknowledgment of how those who struggle with energy poverty are held back from full participation in social life.

This is not to say that energy poverty is not a distributive justice issue — it certainly remains so in the sense that some have to go through much more extreme lengths in securing access to their basic energy needs. These going to extreme lengths, in Tsay Keh, are manifest in practices that require the use of propane — the only (energy) ingredient of practice that is accessed through a direct market relationship between users and suppliers, and one whose price per unit of energy is ten times the price of natural gas in the rest of BC. The active presence of the nation's government as a mediating entity in securing access to electricity as an ingredient of practice, as well as households' ability to access wood outside of a market relationship, mitigates a full manifestation of higher energy burdens in Tsay Keh households. In this regard, Tsay Keh presents not a case study of energy poverty, but a case of immense resilience and the successful mitigation of some of the worst implications of precarious energy access by transferring burdens from the household level to the community level. I will explore this facet of Tsay Keh's energy provision and its implications for energy poverty more thoroughly in the following chapter.

Chapter 5

Tension in the Wires

The previous chapter was primarily dedicated to describing how precarious energy access is felt in the day-to-day home lives of people in Tsay Keh. My goal was to imbue the practice theoretical descriptions of how home maintenance practices are performed with an acknowledgment of the processes through which access to the material arrangements that are required for these performances are secured. In other words, I wanted to describe how precarious energy access manifests itself at home, while calling into question the taken-for-granted nature of access to ingredients and materials of practice. I developed the concept of relationships of access in order to highlight the importance of these processes, and demonstrated how they indeed configure the compromises in comfort, convenience, cleanliness that come with precarious energy access.

This strategy was in part motivated by a desire to battle what Graham and Marvin (2001) refer to as "The withdrawal of consumption politics into the networked spaces of individualised households" (p.72). My goal was producing an account of the experience of energy poverty that is attentive to how energy poverty, like other forms of poverty, is a systemic problem — one that might manifest itself in individualised households, but is produced and reproduced through processes that operate at scales other than the household. In this chapter, I take a step back from these households and the practices that unfold within them and instead focus on how those relationships of access come about as part of larger planning paradigms and how they may be reconfigured in the interest of community energy justice. What I have in mind is a sort of zooming out from the household level to specifically discuss how energy poverty is historically, geographically, politically and materially constructed and maintained so that households and communities like Tsay Keh continue to experience precarious energy access despite Canada (and

BC's) supposed energy abundance.

In Section 5.1, I will begin with a historical account of how BC's current electricity system came about, focusing particularly on the energy development practices of the Province between 1960 and 1985 when the majority of the current generation capacity was developed. In the process, I will outline four key characteristics of the energy planning and provision paradigm that define BC's energy system and lead to its particular forms of inequality in access to energy. Then, in section 5.2, I will explicitly link these characteristics of BC's energy planning paradigm to Tsay Keh's experience of energy poverty. In this section, I will discuss how the community-level experiences of energy poverty in Tsay Keh manifest themselves and how these experiences relate to a specific energy planning processes in BC. My focus here will be on the specific consequences of BC's centralized energy planning paradigm which has historically (as well as contemporarily) been driven by a desire to attract industry through the provision of cheap electricity to industrial consumers. Then, in section 5.3, I will turn to the question of how this particular trajectory of energy development collides, in Tsay Keh, with an alternative paradigm (that of community energy project development) which in this case takes the reversal of the patterns that lead to energy poverty in Tsay Keh as its central aim. In this section, my aim is to present a contemporary discussion of how BC's energy planning/provision paradigm continues to produce relationships of access (in Tsay Keh) that create energy poverty.

In pursuing this agenda, I'm motivated by this segment of an interview I conducted with Dave Porter, President of First Nations Energy and Mining Council in 2011 when I was working on a project that looked at community visions and motivations for participating in community energy projects (Rezaei and Dowlatabadi, 2015, see):

> First Nations are in an energy poverty situation and what we need to do is to bring many of these rural and remote First Nations into [an] energy self-sufficiency position.
>
> Dave Porter, June 10, 2011

What I found remarkable about this statement was how energy poverty was spoken about not as a thing experienced by households, but rather a problem experienced by rural and remote communities. It seemed to me, then, that rural and remote communities were important sites in networks of infrastructure, that their particular geographies of inter/disconnection presented interesting opportunities for investigating energy vulnerability beyond the household and as a problem faced by communities in net-

works of energy production and consumption. I hoped that by looking at a remote community like Tsay Keh, and the processes that lead to the household and community level experiences of energy poverty there, I could open a space for the recasting of energy poverty as a product of specific patterns of energy production, distribution and consumption.

My goal in this chapter is, then, to suggest that energy poverty in Tsay Keh is a product of BC's particular version of a centralized power provision paradigm, which, in Northeastern British Columbia, serves the government's particular political project of developing resource extractive industries through the provision of cheap electricity and enhanced market access that the regulated waterways of hydro facilities bring about. Pursuing this political agenda has lent particular characteristics to BC's power planning processes, including prioritizing and planning around industrial energy demand for industries that at the time of planning do not exist and often never materialize, with little to no public scrutiny, thus decoupling energy supply decisions from demand characteristics and the power planning process from the publics. Tsay Keh's energy access situation is a product of this energy provision paradigm in two ways: firstly, it is a product of this paradigm, quite literally, in the sense that the Tsay Keh Dene were displaced from their traditional territories in order for a large dam to built — a dam built specifically to boost industrial development in the North East. A dam that when the industrial development in the region did not materialize contributed to years of power surplus in the province. A dam which produced electricity to which the very people displaced for its development had no access.

Furthermore, this experience of displacement for power development features prominently in how the people of Tsay Keh perceive their energy access situation. As I will argue in section 5.2, the feeling of powerlessness around the community's energy decisions which is a direct product of the experience of displacement, and even more broadly so of colonialism, is an important part of how energy poverty manifests itself at the community level.

Energy poverty in Tsay Keh continues to be a product of this paradigm as efforts to address and reverse energy poverty in Tsay Keh through the development of a community energy project come to a head with the public utility's efforts in energy provision. Tsay Keh's community energy project, as I will argue in Section 5.3, was an attempt to address specifics aspects of energy poverty in Tsay Keh. In the course of its development and interactions with the public utility and the larger energy planning paradigm that it represents, Tsay Keh's energy project comes to challenge and be challenged by BC Hydro's approach to power planning — in the process of this engagement, demands made by

BC Hydro's energy planning paradigm reduce technology choices for the community energy project, ultimately leading to the abandonment of the project, and the maintenance of status quo when it comes to Tsay Keh's energy access.

5.1 The industry that never comes: energy planning and provision in BC, 1960-1985

The British Columbia Hydro and Power Authority (or BC Hydro) was created in 1961 when BC Electric (a private company) and the BC Power Commission were merged to create a crown corporation tasked with providing power to British Columbia. More specifically, BC Hydro was legislated into being, explicitly to oversee the construction of BC's largest reservoir and dam, what eventually came be to be known as the WAC Bennett dam. BC Hydro's website boasts the WAC Bennett dam as "one of the world's largest earthfill structures" (BC Hydro). Before its construction, years of geological surveys and soil testing added up to what Hudson's Hope Museum calls "one of the largest feasibility studies in the world" (Hudson's Hope Museum). Today, the generators at the WAC Bennett dam along with those at the later-developed Peace Canyon Dam downstream from it, produce about one third of the electricity generated in BC.

The construction of the dams on the Peace river, of course, took place within a larger political context in BC. At the time, the political forces at play in BC, exemplified by the then Premier WAC Bennett, were actively engaged in projects of transformation of nature and its resources to the end of creating a particular vision of BC: an urban, connected and prosperous British Columbia (Loo, 2004). What's more, this vision for prosperity largely rested the industrialization for Northern BC, which Bennett saw as dependent on harnessing the power of the Peace river (Wedley, 1986; Froschauer, 1986, 1999).

Historians of hydro development have documented a pattern of energy development in BC, starting the 1940's and particularly accelerating between 1960 and 1985, that rests on the premise that hydro development is the key to the transformation of BC economy from a primarily resource-based one to one with greater reliance on secondary manufacturing industries (Wedley, 1986; Froschauer, 1986). The strategy employed by WC Bennett and many of BC's subsequent political elites, as Froshauer (1999) argues, was (and some might argue that still is) one of 'industrialization by invitation', whereby certain extractive industries were guaranteed access to BC's natural resources, whether it be forestry or minerals (and more recently natural gas) and offered cheap electricity in order to encourage the processing of

these resources within BC with the aim of stimulating the BC economy.

The development of the WAC Bennett dam on the Peace river was part of this economic development agenda, intended to "provide the Province with a much-needed economic stimulus and contribute to curbing unemployment," as Gordon Shrum, the first chair of the BC Energy Board, tasked with the development of policies for the Peace and Columbia rivers, noted in his 1961 report (quoted in Froschauer, 1999, p.181). In fact, the development of the dam was a part of this agenda not only in that it would supply the industry with cheap power but would also improve access to markets for the industry's products. In the same report, Shrum (1961) notes: "The reservoir area will act as an inland waterway which will open up the Trench area for timber removal, [and] mineral exploration." (p. 28) The development of the WC Bennett dam, then, was carried out with the aim of attracting manufacturing industries to BC through the provision of cheap electricity while simultaneously providing for easy movement of products (unprocessed, semi-processed, or processed) out of the province.

It should be mentioned that the second function of the dam (as means of providing easy access to Northern natural resources) was further enactment of the Bennett government's Northern transportation policy, which led to the Peace River extension of the Pacific Great Eastern Railway and expansions to Fort St. John and Dawson Creek in the 1950s (Wedley, 1986).

Understanding the development of the hydro projects on the Peace river as serving this industrialization agenda is important because it throws into relief the corollary question of the agendas it did not serve — one such agenda is the meeting of an actual existing electricity demand.

Dams, it assumed, are built to meet an electricity demand. This, as I have discussed, was not the purpose of the dams built on the Peace river. In fact, justifying their construction despite this lack of demand for electricity took a great deal of very astute political manoeuvring on the part of WC Bennett and his hydro people, particularly in the development of their two rivers policy, which outlined the development of hydro electricity on both the Peace and Columbia rivers.

The two river policy was Bennett's way of ensuring that hydroelectric development on the Peace went ahead despite and in conjunction with the developments that were being negotiated by other levels of government on the Columbia river. The development of the hydro power on the Columbia river was part of ongoing negotiations between the federal government and the United States government starting in 1944. Interest in damming the Canadian portion of the Columbia river was driven by the fact that its development would increase the productivity of hydroelectric facilities downstream in the US as

well as provide important flood control capacity in both Canada and the US. Furthermore, the electricity produced from damming the Columbia river would satisfy the domestic demand and was, in fact, thought to be the less expensive option for meeting this demand due to its closeness to existing markets (Wedley, 1986, p.272). Without a two river policy, the damming of the Columbia river would make any power produced from the Peace redundant for the domestic market, and would spell an end to the Peace river project, particularly given the constraints imposed by the federal government on exporting power to the United States.

The success of the two-river policy was largely dependent on the availability of an export market. In fact, The Report on the Columbia and Peace Power Projects (BC Energy Board and Shrum, 1961) explicitly states the export-dependent nature of the two-river policy:

> Since the minimum efficient development of either the Peace or the Columbia will provide more power than British Columbia can absorb in the initial years of the project, our consultants have pointed out that it is not possible to start the two concurrently or even phase them without finding a very large market outside the Province for power which British Columbia cannot currently absorb. The low cost of thermal power in Alberta makes development of a market there uncertain; therefore, the only possibility lies in the Pacific Northwest or California (p. 28-29) (quoted in Froschauer, 1999, p.194).

Bennett's astute political manoeuvring was, in fact, in using the negotiations around the Columbia river projects to remove the federal barriers to electricity export to the United States, and thereby securing access to this large market outside of the province. This task was accomplished by arguing that the Canadian entitlement to its portion of the increased hydroelectric generation in the US should be accounted for in terms of long-term electricity exports to the US. Rather than repatriating these "downstream benefits", Bennett, in effect, tied them up in long-term whole-sale electricity exports, and in the process, removed the federal constraints on future electricity exports as well.

By securing regulatory access to the export market (later reinforced by the development of physical infrastructure in the form of regional grid "interconnections"), the Province, in essence, decoupled the development of electricity generation capacity from electricity demand. Instead, it began the pursuit of its economic development agenda of industrialization by invitation through promises of energy plenty. These promises have, to a large extent, shaped the energy planning and provision paradigm of British

Columbia. In the case of electricity, they have guided the Province to the construction of large hydro-electric facilities with the aim of satisfying some future industrial demand. Demand that, in fact, never materialized.

Between 1960 and the early 80's, the BC government's power commission and BC Hydro adopted a demand projection practice that increasingly relied on information from the industry in the form of "firm inquiries" from companies who wanted to establish or expand their operations in BC — a practice that contributed to a large generation capacity surplus, given the industry's interest in the availability of cheap electricity for their operations. In the early 80's, when this large unplanned surplus reached 1.8 GW (or the entire generation capacity of the $2 billion Revelstoke dam), this demand projection practice was finally called into question and BC Hydro was called to account for it (Froschauer, 1999).

BC Hydro's questionable energy planning processes were at this time increasingly the subject of public resistance. Along with a range of global shifts to energy provision practices, these acts of resistance led to some significant changes to energy regulatory practices of the province (Dusyk, 2013). For example, demand for making BC Hydro's planning processes more open to scrutiny, led to the introduction of the Utilities Commission Act, which created the British Columbia Utilities Commission (BCUC) with the mandate to review major energy decision of the province. It is, in fact, through these new review processes, including a mechanism for public hearings, that the third proposed development on the Peace river (site C dam) was delayed in 1983.

Energy planning processes in the province are said to have gone through significant changes in the early 80's (Kellow, 1996). These changes include an opening up of the decision making processes to public scrutiny through the incorporation of public review processes at the utilities commission, as well as the curtailment of BC Hydro's supply-oriented approach, through fundamental changes in accounting for just what can be considered a viable supply of electricity. The most significant change in accounting here was the inclusion of conservation initiatives as a resource on the supply-side, which heralded a significant shift of focus on the part of BC Hydro to conservation initiatives (Dusyk, 2013). Some of these changes have been enduring ones, BC Hydro's planning processes, for example, still include conservation initiatives in their forecasting of future demand (see Figure 1, below, from BC Hydro's latest integrated resource plan, for example). The Province's commitment to other ones have been less strong. For example, in refusing to submit to a BC Utilities commission review of the Site C dam, the Province is relying on a planning paradigm frighteningly similar to what has been described here, this

time with the aim of attracting a Liquefied Natural Gas (LNG) industry (again, see Figure 1, below from the 2013 Integrated Resource Plan).

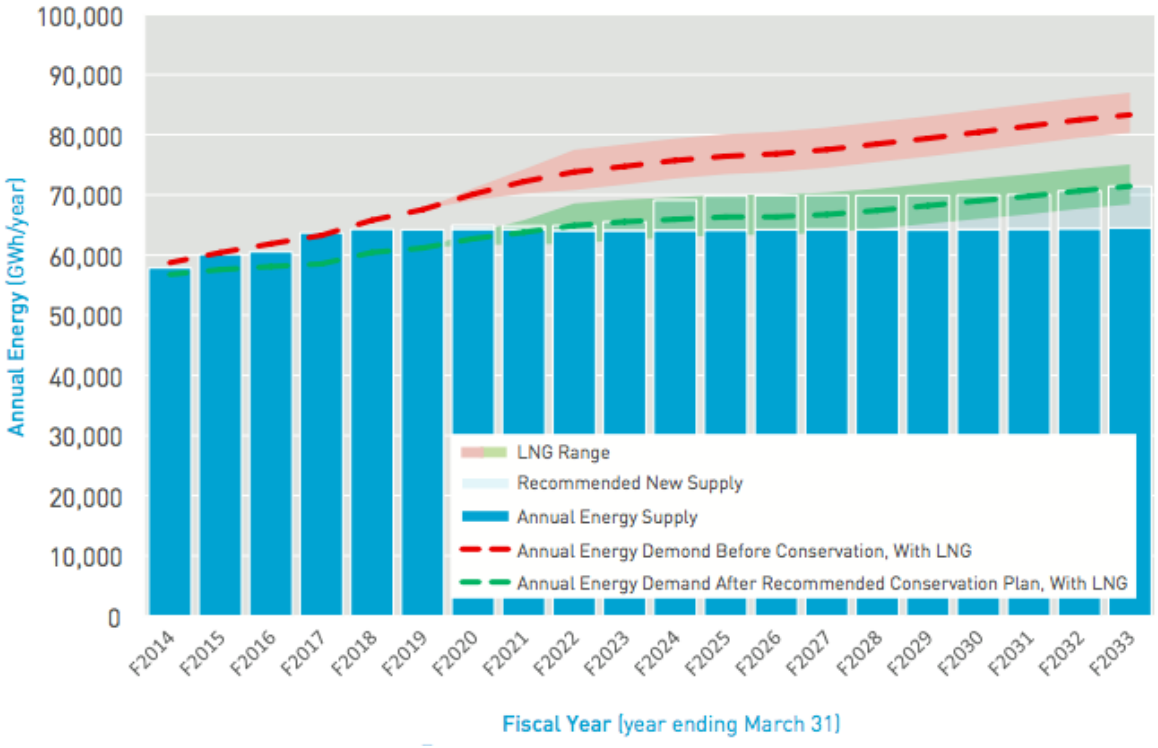

Figure 5.1: Image from BC Hydro's 2013 IRP projecting future electricity demands (BC Hydro, 2013, 2-2)

What follows from this analysis is a view of the development of the WC Bennett dam as explicitly a resource extraction project (in itself, in the use of its reservoir as enhancing the movement of other extracted resources, and its enabling of other extractive industries), particularly one whose main product was decoupled from any actual need for that product. Furthermore, pursuing this political agenda, has meant that the energy planning process in BC has been guided by BC's political elites, with little public scrutiny until 1985 and the introduction of a public review mechanism in the Utility Commission's review process — a review process, which can be, and in fact was suspended by the government when its decisions is feared to interfere with the political agenda of industrialization by invitation. Seen in this light, the WC Bennett dam is an artefact of a particular energy development paradigm in BC — one that saw the development of large centralized power projects as instrumental to economic development in the province and did so aspirationally, without any link to actual demand. This artefact and the larger paradigm of which it is emblematic, of course, produce, in addition to electricity, particular modes of

access and different classes of users, whose needs are prioritized differently and whose subjectivities are shaped through their engagement with these variegated modes of access. In the following section, I will discuss Tsay Keh's particular relationship with the WC Bennett dam and BC's electricity planning and provision paradigm and the ways in which Tsay Keh's energy poverty is a product of that relationship.

5.2 The so-called beautiful Williston lake

In this section, I discuss how the energy planning paradigm outlined above impacted the Tay Keh Dene during and after the construction of the WC Bennett dam and how these impacts lead to specific material and political manifestations of energy poverty in Tsay Keh, both historically and contemporarily.

The construction of WAC Bennett dam was started in 1961 and lasted until 1968. As part of the process, 350,000 acres of land were flooded at the confluence of Finlay, Parsnip and Peace rivers flow regimes both upstream and downstream of the dam were altered, and the ecological systems that rely on the 3 rivers were severely affected (Loo, 2007; Baker et al., 2000). This included the blocking of the east-west migration route of the now endangered mountain caribou (Loo, 2007), and the loss of habitat for many species in the immediate vicinity of the reservoir, as well as further downstream in the Peace-Athabasca delta (Rosenberg et al., 1995). The environmental impacts of the dam were largely aspects of its construction on the Peace river which were not considered by the feasibility studies (Koyl, 1993, p.83). Even less attention, however, was paid to any impacts the dam might have had on people whose lives would be altered by the project. In fact, as Koyl (1993) reports, Thomson-Houston Co, the firm tasked with conducting the feasibility study for the construction of dams on the Peace river had declared the region virtually uninhabited: "the reservoir area at the moment is largely virgin forest, with less than a hundred permanent inhabitants" (The British Thomson-Houston Co. Ltd., 1958, quoted in (Koyl, 1992)). The inhabitants mentioned here were ranchers, and ranching, in fact, is the only human activity identified in the report (Koyl, 1993, p.82).

This failure to identify and acknowledge the Sekani people that lived in the Rocky Mountain Trench, particularly the group known to the Canadian bureaucracy at the time as the Finlay River Band[1], allows for planning for building a dam, as if it was on no one's land — an invocation of terra nullius' if there ever was one. In fact, as Koyl (1993) describes, Indian Affairs did not become involved until December 1959 when an employee of Indian Affairs discerned from BC government publicity that five reserves could be affected by the dam (p.85). Citing internal Indian Affairs correspondence, Koyl goes on to

describe how this employee contacted the regional office requesting maps to evaluate the impact on reserves throughout the reservoir area. Eventually, in 1962, INAC initiated a meeting with BC Hydro representatives to discuss, for the first time, the effects of the dam on the indigenous communities in the area. For the next several years, as the scope of the project was refined, INAC negotiated with BC Hydro and determined a resettlement plan for the community (which ended up being the only indigenous community affected, once the scope of the project was better defined), which ultimately proved inadequate.

British Columbia's largest hydro-power reservoir, Williston Lake reservoir, was then created behind the dam, at the confluence of the Finlay, Parsnip and Peace rivers, by flooding the old settlement, traplines and hunting grounds of the community of Tsay Keh Dene as well as other lands. The "flood" (the term used by community elders refer to the event that changed their community's sense of self and place), the resettlement in two new reserves, the eventual trip back to their traditional territory and the ultimate move to the current village in 1991 mark a period of turmoil for the people of Tsay Keh. In fact, in an unpublished manuscript of a memoir of displacement and the subsequent trip back home, one of the community elders who participated in my interviews reflects:"The flood of the so-called "beautiful" Williston Lake marked a turning point for us mountain people of the Finlay River."

That dams cause displacement -and often that of indigenous peoples- is not a new story (McCully, 1996; Martin and M Hoffman, 2008; Porteous and Smith, 2001). Nor is it new to say that they create an altered landscape that alters the lives of those whose homes are inundated by dams. But what I wish to do in this section is to link this altered landscape and subjectivities, specifically to Tsay Keh's experience of energy poverty, both historically and contemporarily and to therefore reframe the particular manifestations of energy poverty in Tsay Keh as a product of the trajectory of energy development that I described in the previous section — A trajectory whose legacy is still alive as the province pushes on (and encounters resistance to) the development of the delayed site C dam.

I have already mentioned some of the changes to the landscape in the aftermath of "the flood." More specifically of concern to my argument regarding the altered landscape and subjectivities, are two impacts of the flood: First is the change in the navigability of the Parsnip and Finlay rivers, both due

[1]The Finlay River Band was created in 1959 when Fort Grahame and Fort Ware 'bands' were amalgamated. Fort Grahame and Fort Ware bands had previously split off in 1920s after the establishment of Fort Ware at the confluence of Fox and Kwadacha rivers. The Finlay river band later, in 1970, split into Fort Ware and Ingenika Bands again, and later became known as Kwadacha and Tsay Keh Dene Nations (Littlefield et al., 2007)

to the change in the flow regimes upstream of the dam, and the fact that the waters were littered with debris from the harvested and non-harvested wood that was never removed. In fact, a recent debris management study for the Williston lake area reports that only 21.7% of the total area inundated by the dam was cleared prior to the flood, according to calculation by the Department of Lands, Forests, and Water Resource (DWB Consulting Services, 2015, p.3). In short, what were navigable waters before became dangerous and unnavigable. People, who in my interviews recall tales of travelling up the river to the Yukon, now became land-locked and isolated, particularly from their neighbouring communities in Kwadacha and around Takla Lake. An elder recalls the changes in the river:

> When they started flooding they burnt all our homes. And when that happened, we couldn't move back up, because when they started flooding, the debris with all trees on the lake and all the reservoir was coming up and it's too dangerous to go in a boat to — to go anywhere on the lake because of all the debris and the high winds and everything else.
>
> Cathy, Feb 27, 2013

In fact, Tina Loo (2007) quotes a BC Hydro consultant saying, in 1977, that this isolation had "radically altered" the community and could be thought of as responsible for "the high incidence of social disorganization" (p.906) characterizing the community before community's eventual resettlement at Ingenika and then the current village.

The second impact of importance to my argument has to do with perhaps an even more immediate need of the community: the ability to feed itself. My interviews with elders from the community, are again, filled with accounts of the flooding of traplines and old hunting grounds, of moose drowning, moose being terrified and running away, and of the community struggle to secure enough food. This is how an elder explains the changes in the ability of the community to practice hunting, suggesting that the unnavigability of the waters further intensified the problem with food:

> To make a long story short, it was horrible. People suffered. Even wild animals were hard to find, like moose and all that any kind of animals that were near enough that got caught unaware, drowned. So moose was really scarce. A person had to go a long way to try and get a moose because animals were terrified too. They all fled. So, can you imagine starvation when there was no job? We were displaced. We weren't even in our usual area. My dad's trap line and hunting areas were further up the Ingenika. Finlay area. So we were way down. And when my dad lost his boats, we can't go anywhere.
>
> Cathy, Feb 27, 2013

In fact, Harris, in her 1984 study, reports an estimated figure, produced by the British Columbia Ministry of Environment, of approximately 25,000 moose lost due to the building of the WC Bennett dam (Harris, 1984, p.46). Furthermore, numerous sources report on the high levels of mercury present in fish from the reservoir due to the decomposition of the vegetation that was never cleared prior to flooding the valley (Rosenberg et al., 1995) — many community members worry about mercury in the fish from the reservoir still today (Littlefield et al., 2007; Azimuth Consulting Group Partnership, 2015, see for example). Most importantly, displaced to other reserves after the flood, the community of hunters and trappers became unable to sustain themselves. Again, Tina Loo (2007), reports an increase of 80% in federal and 300% in provincial social assistance between 1965 and 1970 in these communities.

All of this, of course, coincides with other colonial projects of the Canadian government. The horrors of residential schools and the Sixties Scoop, in particular, are at this moment unfolding in BC, and I'm told in interviews of youths (themselves elders as they tell me this) coming back from residential schools to find themselves doubly displaced by the violence of both the residential schools and the dam, and their people devastated and dependent:

> Oh there was just erosion. There was no more Ingenka. We were living high on a hill. Just windswept and a lot trees were down. But it was very emotional for me when I came back, because what I once knew as a child was no more There was a hopelessness. Just like, they gave up. Because pretty soon now they were introduced to welfare. people quit working. There are people that to this day are still hurting. They are still drinking. A lot have died already.
>
> Cathy, Feb 27, 2013

Colonialism in British Columbia, as Cole Harris (Harris, 2008) argues, dispossessed indigenous people through several concurrent processes. Deterritorialization, as a process with the dual goals of the physical/geographical possession of the land (and its resources), and the unbounding from land of people whose livelihoods previously depended on the land and reteritorializing them in ways that suited capital's needs is certainly the chief mechanism of dispossession in settler colonial societies. This reconfiguration of relationships with the land (including questions of 'ownership' of the land), Harris (2008) argues, is achieved in the settler colonial context of Northern British Columbia through acts of physical violence -such as the flooding of Tsay Keh's land and the displacement of the Tsay Keh Dene- acts of cultural and psychological violence -like the removal of Tsay Keh Dene children to residential schools whose sole purpose was cultural genocide (The Truth and Reconciliation Comission of Canada,

2015)-, and acts of discursive violence that legitimized the enactment of the acts of physical and cultural violence such as the discourse around the uninhabited nature of the Rocky Mountain Trench, as well as other racist discourses of the Canadian state that, for example, enabled the residential schools.

The development of WAC Bennett dam is part of this settler colonial agenda in several ways. As I have argued the building of the dams on the Peace river was solely about attracting resource extractive industries to the province through promises of cheap hydro-electricity and enhanced movement of products. In other words, hydro-electric development on the Peace was not only in itself literally an exercise in the deterritorialization of the peoples who lived in its way, but more importantly, was about granting capital further access to the territories of interior Northeast British Columbia. The WAC Bennett dam and the larger political agenda of which it was a part, therefore, contributed to the dispossession of the people of Tsay Keh Dene, both materially and culturally. It contributed to this material dispossession in its literal and physical possession of their land, and in rendering the community incapable of sustaining itself through land-based practices. References in the interview and archival material cited above to the material poverty that followed "the flood" is, in fact, illustrative of this material dispossession. This experience of poverty (of which energy poverty is a specific form) is ongoing in Tsay Keh, as the once self-sustaining community of hunters and trappers, is cut out of the circuits of the very capital that displaces them. As I argued in the previous chapter, with little access to the labour market, and little ability to determine its own alternatives modes of production with the constant eroding of their territory, people in Tsay Keh struggle to participate fully in the economic exchanges that enable the securing of access to their material needs, of which energy is one.

The displacement of the people of Tsay Keh Dene in the aftermath of the flood also contributed to their cultural/psychological dispossession by degrading their ability to practice their culture (and I mean culture as a political thing) as well as through the development of a sense of dependency, for their material survival, on the very powers that dispossessed them. This sense of dependency also contributes to specific manifestations of energy poverty in Tsay Keh, particularly around a sense of powerlessness with regards to energy decision-making. I would like to present some evidence of the persisting narratives and materialities of dependency on BC Hydro (which is, and is also viewed by the community as, an arm of the government). Here I quote a segment of an interview I conducted with a couple in the community in 2013:

> Me: You said it'd be cool to have your own community energy power why? Like why do you think that is cool?
> Jason: Well, then BC Hydro wouldn't have a lot to say. But then we also use BC Hydro's money to operate a lot of income in the village. [laughs then there is a pause] it's a touchy subject.
> Me: Why is it so touchy?
> Jason: Because of the fact that BC Hydro's helping with putting us to work in little projects here and there. That's the only income out this way, cause we don't sustain ourselves out here. So it's actually run by BC Hydro BC Hydro's putting the money on our table. We don't sustain our own income out here. So it makes it we play by their rules.
>
> Jason and Angela, Feb 18 2013

Chief among the little projects of the "here and there" is a project they call 'the dust program', which aims to mitigate another impact of the dam— namely, the erosion problem on the shores of the reservoir and the dust that blows into the village all summer long when the water levels in the reservoir are low [2]. In fact, Baker et al (2000) in their study of the dust problem in Tsay Keh, report that 80 percent of the residents in the community believe that dust storm from the reservoir are responsible for adverse health effects, such as eye irritation, respiratory tract problems and skin rashes. In addition, in this study, 65% of community members indicated that the dust storms impacted their ability to enjoy the outdoors and complete their traditional activities such as smoking meat (2000, p.571). BC Hydro's dust program attempts to manage the dust storms by increasing the vegetation on the shores of the reservoir. It hires a crew of mostly community members in this project of here and there to plant vegetation every spring in a mostly unsuccessful attempt to manage the dust. Every year, they plant vegetation on the shore in the spring, every summer, the wind blows the dust into the village. It's an ongoing project of seasonal employment, dust, seasonal employment, dust, seasonal employment, dust .... And the tension between the community and BC Hydro, so palpable in Jason's quote, continues with each cycle.

Jason's comment simultaneously highlights two facets of energy poverty in Tsay Keh: first is the persistent lack of access to labour markets in Tsay Keh and its effect on people's ability to secure access to material necessities whose paths of access necessitate either a robust welfare system or access to employment, among which, as I have demonstrated in the previous chapter, is energy. Second, and

[2]The valley floor dammed by WAC Bennett has a fine glacial till that was vegetated prior to the project. The fluctuating water level in the reservoir has led to wide erosion bands denuded of trees. These shorelines are exposed at times of low water level, and are susceptible to wind erosion when dry. Given the geography of the lake, and the flat surface of the reservoir, the area now experiences much stronger winds channelled by the mountain ranges into N-S flows. These strong and persistent winds aerosolize the fine glacial dust towards the village at the northern end of the reservoir.

more importantly in this discussion, is a sense of powerlessness over the community's energy future. Jason and Angela discuss this idea in more detail in a section of our interview preceding the quote above:

> Angela: [It] would have been nice if we tried that wind thing. energy.
> Me: yeah? wind power?
> Angela: yeah.
> Me: why?
> Angela: It'd be quieter. We have a lot of wind over the lake anyways, every once in a while. And have a back up of having the solar. But that's a whole new ...
> Jason: That's a different ball game. BC hydro wouldn't like that idea. BC Hydro wouldn't like that idea, because of the fact that Williston Lake is supplying the power and energy out this way. Why would they put up a big wind mill? Unless they were running it themselves [...] but like I said, BC Hydro is the one who runs the show out here. And I don't think they'd allow wind mills out here.
> Me: Why won't they?
> Jason: Because it goes against BC Hydro all together.
> Angela: It would be us having our own energy.
>
> Jason and Angela, Feb 18 2013

The community's sense of dependence on BC Hydro, of course, is complicated and troubling to community members' minds, but as Jason and Angela point out, it has specific manifestations in discussions of the community's energy future. For them (and other community members) it amounts to a powerlessness over making decisions with regards to how the community meets its power needs. This powerlessness is an aspect of the energy poverty experience which an understanding of energy poverty as a justice issue can incorporate under discussions of procedural justice (and one which understandings of energy poverty as a technical problem fail to integrate into their analysis altogether).

On the most basic level, applying a procedural justice lens to questions of energy access demands the inclusion of ordinary citizens, especially those affected by energy developments in the planning and decision-making processes involved in energy provision and policy. In fact, the community energy literatures, increasingly demand participatory processes of energy planning and hail their 'democratic' powers of 'transformation' (Dusyk, 2013; Simcock, 2013; Leggewie and Nanz, 2013). Of course, it goes without saying that participatory practices were not used in the development of WAC Bennett dam. Nor were basic participatory mechanisms such as public hearings in the environmental review process relied upon in the development of site C dam unfolding today. However, the application of a procedural justice lens to Tsay Keh's energy access situation is by no means about pointing out this historical injustice. Rather, it is about acknowledging the persistent effects of that injustice, while recognizing

that the community's desire and struggle to address these effects, for example through the development of its own alternative energy projects, is located in the present.

The community's relationship with BC Hydro and the sets of energy planning practices that BC Hydro embodies is among these reverberating legacies: that the community continues to remain without access to the electricity grid, even as they were displaced for the purpose of hydroelectric development, is a constant reminder of the very unequal distribution of costs and benefits in the development of WAC Bennett dam and the energy planning paradigm that enabled it — a fact that continues to underpin a tense and acrimonious relationship between the community and BC Hydro. I knew of this tension in an abstract way, before I ever set foot on Tsay Keh territory; but it was not until a trip to the administration offices of the Nation in Prince George in December 2012, when sandwiched between the retelling of racist comments made by BC Hydro employees on flights to Tsay Keh, I was told by a (white) employee of the Nation of a BC Hydro representative who was recently banned from Tsay Keh territory. The comment that had gotten them banned sounded callous and insensitive to my nave, uninitiated ears. To have gotten banned from the territory for something that was "just callous" spoke of underlying tensions that I only begun to understand when I later encountered the very visceral accounts of loss, and of the persistent and living sense of injustice born out of development of the dam and the continued lack of access to the grid in the community. Accounts that not only highlighted an uncomfortable dependency on BC Hydro and a sense of powerlessness in the face of that institution as the above quotes do, but also offered more justice-oriented understandings of that relationship:

> But this thing with Hydro it's gonna keep going even after we're gone, you watch. They're gonna pay. They're still paying. There's no such thing as settlement. It's gonna be on their conscious and they know it.
>
> Cathy, Feb 27, 2013

Rather than merely framing the community's contemporary relationship with BC Hydro as a case of unwanted dependency, this elder alludes to the inherently ongoing nature of any restitution work, and of the implicatedness of the two entities in each other's trajectories. What this elder demands is a recognition of the role of BC Hydro (and the various levels of government that enable its energy planning practices) in settler-colonial processes that continue to dispossess the Tsay Keh Dene, as well as a recognition of the responsibility of these energy planning processes in creating Tsay Keh's precarious and unjust energy access situation. It is in this sense that addressing energy poverty, or the pursuit

of energy justice in Tsay Keh requires addressing colonialism and taking a decolonizing approach to energy planning.

Decolonizing the energy planning and provision paradigm in BC requires a robust engagement with questions of land and resource governance on territories of indigenous peoples, including above all else respect for indigenous sovereignty. To this end, the path to reconciliation between the province of British Columbia and First Nations communities whose territory it occupies demands steps towards a relinquishing of territorial control (both materially and as it pertains to land and resource decisions) by the province, and the provision of compensation for losses to indigenous communities (Kotaska, 2013). However, the pursuit of energy justice in Tsay Keh also demands fundamental changes to the nature of energy planning and provision in BC, including addressing its lack of transparency, re-establishing the link between energy demand and energy generation capacity, creating meaningful opportunities for public participation in energy planning, establishing mechanisms by which settler government and First Nation governments share decision-making authority and revenues from energy developments on their lands, and in places like Tsay Keh, a shift from the centralized power production paradigm which has historically excluded 'remote' communities like Tsay Keh from access to its networks of energy distribution. When Jason and Angela discuss and then reject the possibility of developing renewable community energy projects on their territory given BC Hydro's involvement, they tap into a critique of this energy planning and provision paradigm, of which BC Hydro is seen as an embodiment. Jason and Angela, of course, aren't alone in their analysis of the tensions between BC's energy planning paradigm and the pursuit of renewable community energy projects. Rob also brings up this tension, but does so with an eye to the larger processes of energy planning in the province:

> Why do you think we haven't gone to wind power or solar yet here? Because BC Hydro dictates to these guys -BC Hydro's trying to put a dam in their site C Dam, so would they look very good, encouraging these people to put windmills up here, I don't think so. I think it'd be a conflict for them to go ahead and put windmills here and then have these farmers over in the Peace Arm complaining about why are you wanting to take our farmland and flood it when you're putting windmills over there? I don't think they want that kind of a system to be set up here.
>
> Rob, Feb 19, 2013

Again, BC Hydro here is seen simultaneously as an embodiment of a larger energy planning paradigm, and also an arm of the government. This energy planning paradigm, again, is seen as something fun-

damentally incompatible with the development of community energy projects which communities are increasingly demanding as part of transitions to both more environmentally sustainable and politically just futures. The tensions between this larger energy planning trajectory and the pursuit of community energy projects is something that Tsay Keh has much to say about. This tension, and Tsay Keh's contemporary struggle for energy justice is the subject of the following section.

5.3 Tension in the wires

The previous sections in this chapter have been predominately focused on outlining a historical trajectory of power development in Northeastern British Columbia and discussing the impacts of this trajectory, both historically and contemporarily, on the people of Tsay Keh. In the course of this discussion, I have suggested that Tsay Keh's energy poverty is a product of this very system of energy planning and provision. It is a product of this system through the forces of colonial dispossession that have eroded the community's ability to meet the needs of its members. Here, energy poverty in Tsay Keh is merely a manifestation of larger material poverty brought about, in this case, through the flooding and destruction of Tsay Keh territory as well as other settler colonial practices of the Canadian state. I have also argued that energy poverty in Tsay Keh is made manifest in the form of a sense of powerlessness over the community's energy decisions, particularly as it relates to community's desire for alternative energy projects. This form of energy poverty, I have argued, is also a product of an energy planning and provision paradigm which excludes public participation in general, and more specifically in the case of Tsay Keh and other indigenous communities ignores the sovereignty of nations on unceded lands and/or rights and title claims enshrined in historical treaties.

Throughout this discussion, I have alluded to the ongoing operation of this particular paradigm of energy planning and provision, for example with reference to the current debates and plans for the development of the Site C dam. In this section, I aim to continue with this highlighting of its ongoing operation in British Columbia, but rather than shifting focus to Site C, I will examine the ongoing operation of this energy planning and provision paradigm in relation to the development of community energy projects, particularly Tsay Keh's community biomass project which was under development from 2008 to 2013.

5.3.1 The beginnings of the Williston reservoir biomass project

The tensions that the community members quoted above were alluding to in the context of hypothetical renewable energy projects, did in fact come to a head in the discussions and negotiations around the development of Tsay Keh's bioenergy project. Throughout its development, I was fortunate enough to observe (and participate in) the process by virtue of the fact that my PhD supervisor, Hadi Dowlatabadi, on a sabbatical leave from UBC during the peak period of project development, was heading the technical engineering design and development of this project. A good friend, Sonja Wilson, whose masters thesis was a feasibility study of this very project (Wilson, 2012), was the lead engineer. I, therefore, had exceptional access (both through conversation with the technical design team and in being able to attend relevant meetings with BC Hydro) to the ongoing negotiations with BC Hydro and other entities on the development of the project. The materials presented in this section are, as a result of this level of access, a sort of insider's view of community energy project development and its collisions with the prevailing trajectory of power provision in the province.

Tsay Keh's community energy project was catalysed in 2008 when a whistleblower of sorts called Hadi about accounting for the greenhouse gas emissions associated with burning the debris wood that piles on the Williston reservoir. Hadi has long been critical of the way BC Hydro accounts for and reports the associated greenhouse gas emissions of BC's electricity system —for example, he critiqued emissions accounting associated with electricity exchange between BC Hydro and its power trading partners (Dowlatabadi, 2011). He is the person you call if you think things that are not accounted for should be included in the calculus. The whistleblower reported that BC Hydro, in another one of the projects of "here and there", had contracted the Tsay Keh Dene Nation to remove the debris wood from the reservoir, pile it on the shores, and burn it. The unidentified whistleblower was concerned about accounting for the GHG emissions, Hadi wondered if that wood could be used as a basis for economic activity (e.g., wood pellets) or to produce energy. It turned out that the community leadership wondered the same.

BC Hydro's water licence requirements are such that the "lake" must be navigable. To ensure this navigability, BC Hydro collects the debris wood that floats from the bottom, falls from the shores or otherwise finds its way into the reservoir and piles and at the time was being burned on the shores[3]. In fact, in their application to BC's Innovative Clean Energy (ICE) Fund, the project team that eventually

assembled to develop the "Williston Lake Biomass Energy System" estimated that this annual wood burning in the past has had an energy value equivalent to 30 million liters of diesel (Tsay Keh Dene, 2010).

In its 2010 iteration, The Williston Lake Biomass Energy System proposed to burn 2000 tonnes of wood debris from the shores of the reservoir to produce a gas through a gasification process, which would then be fed into a modified diesel engine to produce electricity, meeting the 300 kW peak demand of the community and producing approximately 1020 MWhr of electricity per year (Tsay Keh Dene, 2010). The project was to improve air and noise quality in the village by displacing some of the diesel load in the community and preventing the open-fire burning of the wood and create 4 jobs in the community. Furthermore, through the proposed project, the funds formerly used to buy diesel would be used in supporting the local economy. Beyond these tangible benefits, the energy project was seen as an opportunity to turn "something that is a negative in the community to something good", Chief Dennis Izony told me in an interview in 2013. When I asked why the community chooses to pursue this project, I was also told repeatedly that the bio-energy project was about "being rid of the diesel generators" and achieving "self-sufficiency" (Energy Project Team Member, May 20, 2011).

The self-sufficiency discourse around community energy development, of course, is not unique to Tsay Keh. In fact, many of the BC First Nations communities, remote or on-grid, explain their motivations for engaging with community energy projects in terms of realizing a self-sufficiency goal (Rezaei and Dowlatabadi, 2015). However, as in the case of the broader self-sufficiency discourse among BC First Nations communities, Tsay Keh's understandings of self-sufficiency are multi-faceted and reveal critiques of the nature of energy provision in BC, as well as a desire for a material self-sufficiency in the energy domain. While this material self-sufficiency is about the meeting of the energy needs of the village independently of the diesel generators, by using locally available resources the political dimension of energy self-sufficiency aligns in several ways with the self-determination and sovereignty discourses of indigenous communities in settler colonial contexts. To the community, self-sufficiency through the energy project can come through a variety of avenues beyond material self-sufficiency in meeting energy needs. My interviewees tell me self-sufficiency can come through the possibility of revenue generation for the community if energy projects were set up as community enterprises, and through employment

[3]BC Hydro has since sought other debris management plans for dealing with the wood piles on the reservoir. A summary of some management options presented to BC Hydro by a Consulting firm DWB is summarized in their 2015 report (DWB Consulting Services, 2015).

that is independent of BC Hydro. In both instances, the community desires an end to the dependency on settler-colonial government institutions that have historically been implicated in their dispossession. Interviews with community project administration staff, also highlight other self-sufficiency functions to be achieved through engagement with community energy projects. In this case, self-sufficiency can be about gaining power over energy decision-making processes:

> And that's just one thing I've heard communicated clearly from many community members: they just want to be self-sufficient, and running their own affairs.
>
> Energy Project Team Member, May 20, 2011

Tsay Keh's energy project, then, was a power project, literally in the material sense and also a 'power' project in the sense of reclaiming decision-making space, which was hitherto centralized with the settler-colonial state. The energy project, in this way, was an intervention into and disruption of the operating land and resource planning paradigms of BC, both with regards to energy planning decisions and more broadly the politics of self-determination. In fact, when I interviewed a member of the community energy project team in 2011, they discussed the ways in which seeking material self-sufficiency (power as energy) and political self-sufficiency (power as political power) are entwined for the community:

> Unfortunately, whether community members agree with it or not, they do have a relationship with INAC and they are very dependent upon it and to get off that dependency is going to require projects like bioenergy self-sufficiency. And then you can generate revenues and you can become self-sufficient in so many more ways that you would like to define as a community.
>
> Energy Project Team Member, May 20, 2011

Keeping in mind the entanglements of these two invocations of a 'power project' in the context of Tsay Keh's community energy project, I want to spend some time discussing the ways in which Tsay Keh's community power project intervenes in and disrupts the electricity planning paradigm which I described in the first half of this chapter. To do this I want to briefly go back to the earlier discussion around a relational (or dialogic) ontology, and specifically discuss its implications for understanding the energy space of Tsay Keh.

5.3.2 Relational (energetic) encounters

Tsay Keh's energy space, as has been evident throughout this discussion, is a contested one. In many ways, it is a space shaped by competing notions of what counts as legitimate power needs, and what power provision mechanisms should be employed in meeting these needs. Furthermore, what I have described to be Tsay Keh's particular energy access situation is made particular from the vantage point of urban and southern British Columbia which has had access to some of the cheapest electricity rates in North America (Hydro Quebec) and whose demands and desires has charted particular trajectories of energy and resource development in the North (Wedley, 1986), creating geographically segregated areas of energy production in the North and Consumption in the South (Dusyk, 2013). Tsay Keh's remoteness, its state of disconnection from the electricity grid only means something in relation to the "urban and interconnected" British Columbia. Its energy poverty, has specific meanings in relation to the "energy abundance" of British Columbia. Its community energy project speaks to specific aspects of the provincial trajectory of energy planning and provision that I have outlined.

The negotiations around the development of the community energy project reveal further elements of this trajectory and its present role in shaping Tsay Keh's precarious energy access. As the community energy project developed through various feasibility and design stages, it engaged in various ways with the history of resource development in the region and articulated an alternative to that trajectory in the form of community-based energy planning and development. The meeting of these two trajectories of power development, then, is an opportunity to reflect on the present day operation of the provincial power provision paradigm in maintaining a variegated system of energy access. However, it's important to note that these trajectories meet in Tsay Keh, not just in the sense that the community energy project speaks back to some legacy of the provincial energy planning paradigm. The provincial energy planning trajectory is, of course, discursively present in Tsay Keh in that sense — in the legacy of the WAC Bennett dam, its impacts on the people of Tsay Keh and the ways in which that history shapes Tsay Keh's views of energy use and access. But it is also materially present, in a contemporary way, through the operation of BC Hydro's Remote Community Electrification (RCE) program.

RCE was born after the government of British Columbia passed a legislation in 2007 mandating BC Hydro to take steps to ensure the benefits of our so-called "heritage assets" (i.e. the dams) are available to all British Columbians (Government of British Columbia, 2007). This effectively meant a

mandate to BC Hydro to provide power to off-grid communities like Tsay Keh, who were previously operating their own energy systems. This making available of the benefits of the so called heritage assets was supposed to provide a mechanism by which the high costs of electricity generation in off-grid communities could be at least partly subsidized by revenues generated from the BC Hydro system in the province. In its initial iterations RCE would see the responsibility for the operation of diesel generators in remote communities transferred to BC Hydro. As part of this process, BC Hydro would assume the responsibility of power provision, take over the ownership of community generation assets from communities, receive the INAC subsidies which paid for (a part of) community's electricity generation[4], and provide power to the community at rural BC rates. Since BC Hydro was going to sell power to the communities at rural BC rates (at the time 11c/kwhr), this process was thought to reduce the costs paid by communities for the provision of electricity (which for diesel generated electricity was at the time close to 50c/kwhr).

However, interest on the part of BC First Nations communities in renewable energy projects as paths to self-sufficiency (Rezaei and Dowlatabadi, 2015) necessitated BC Hydro to move beyond the operation of diesel generators and engage with communities' renewable energy projects. Early on, BC Hydro found that that in many cases the communities were only interested in BC Hydro service if discussions of renewable energy were not part of the negotiations. Alluding to the historically tense relationship between many First Nations and BC Hydro, a BC Hydro representative explained to me, in 2011, the importance of including community renewable energy projects in the discussions:

> In a lot of cases, the communities aren't interested [in RCE]: [...] the economics alone don't justify going with BC Hydro service necessarily, in a lot of communities. So, they want clean energy, and they want BC Hydro rates because there's a saving there [...] they're kind of linked together.
>
> BC Hydro Representative, May 30, 2011

This insistence on the inclusion of renewable community energy projects in discussions around the RCE program was one of the first points of contact between the community energy trajectory and the larger paradigm of which BC Hydro is emblematic. This initial contact is particularly interesting because it represents an opening in which community energy is articulated in this space as an alternative paradigm to the thing that BC Hydro represents.

[4]In addition to the INAC funds formerly received by Tsay Keh, BC Hydro received a 10% bump in the subsidy. INAC funds were also used to buy the capital equipment.

Community energy projects occupy somewhat of an ambivalent space in the academic literature. There is ambiguity (and some of it even strategically so) around just what constitutes a community energy project, ranging from industry-developed, but "community-sized" projects to industry-developed projects that have specific local impacts, to community owned and operated energy projects (Walker and Devine Wright, 2008). The concept itself has its roots in several different kinds of literatures including the 1970's discussions around "appropriate technologies" and "soft energy paths" (Lovins, 1978; Schumacher, 2011) and their more contemporary manifestations in the literature on distributed generation (IEA, 2002). The distributed generation literatures, certainly, position a network of smaller, community-sized energy projects as a distinct alternative to energy provision systems that rely on large centralized power plants like BC Hydro's generation facilities on Peace and Columbia rivers. Since renewable energy projects, often produce smaller community-sized amounts of power, distributed generation literatures are often closely linked with discussions around the integration of renewable technologies in electricity grids (Pepermans et al., 2005). Community energy projects, as conceptualized in these literatures, then, offer fundamentally different characteristics to existing centralized systems in technical terms, including the use of renewable technologies and generation scales that are far smaller than the systems that have dominated the energy landscape in the post-WWII era.

Community energy also finds a home in less technical literatures that advocate for public participation in energy planning on 'democratic', procedural justice and sustainability-related grounds. It has been argued that community energy projects might be more attuned to local needs and values (Hoffman and High-Pippert, 2005), and that community energy projects lead to more sustainable and 'democratic' outcomes (Wolsink, 2007; Leggewie and Nanz, 2013). While much of this literature relies on simplistic notions of democracy and sustainability, more recent work attempts to ask important questions about how 'local' communities view and participate in the development of community energy projects (Maruyama et al., 2007; Jeong et al., 2012; Rodman, 2013).

'Community energy' in this context is invoked within a vast array of political agendas ranging from those who seek to implement community energy projects as 'justice' projects (Rezaei and Dowlatabadi, 2015, see for example), to those who use it as part of a 'neoliberal' agenda challenging government utility monopolies (Morris, 2013; Pepermans et al., 2005, see) or those who seek to increase the local publics' acceptance of industry-led projects within these neoliberal energy landscapes (Devine-Wright, 2005; Ellis et al., 2007; Van der Horst, 2007; Wüstenhagen et al., 2007; Warren and McFadyen, 2010,

see). In many of these invocations, however, community energy is articulated, again, as a mode of energy planning and provision in stark contrast with the more mainstream paradigm of centralized power provisioning which has been characteristic of the post-WWII era. Instead of building large power plants, often in places far from the sites of consumption and transporting that power through the grid, community energy projects and the distributed generated networks of power that they will be a part of are seen as a closer geographical pairing of electricity generation and consumption (Calvert and Simandan, 2010). These projects also fundamentally challenge the notions around who should be included in the planning process for energy development, arguing for greater inclusion of publics (sometimes narrowly envisioned as independent power producers in liberalized energy markets) over the state and its technical experts.

In BC, community energy planning and projects, as Dusyk (2013) outlines has been used to challenge the BC government and BC Hydro's supply-oriented energy development approach. In the space of contemporary BC First Nations communities, renewable community-initiated energy projects are initiated in pursuit of communities' self-determination agendas, and as I have alluded to above and argued elsewhere (Rezaei and Dowlatabadi, 2015), are seen as important mechanism for addressing colonialism and resource-extractive capitalism in British Columbia. Here, community energy attempts to foreground 'communities' and their priorities and needs over that of extractive capital. In fact, the communities' insistence on the need for community renewable energy projects, in BC remote communities, led to a broadening of the BC Hydro RCE mandate from simply providing more affordable energy to off-grid communities to meeting 50% of the electricity demand in these communities using renewable projects (Hawley, 2010). It is in this sense that the interactions between the community energy paradigm and the centralized energy planning paradigm that BC Hydro has historically represented throw various aspects of these paths to energy provision and planning into relief. In the following sections, I will explore three key issues in the interactions between these two energy provision trajectories in the space of Tsay Keh's community energy project development to reveal contemporary manifestations of BC Hydro's approach to energy planning as it relates to community energy projects.

5.3.3 Renewables

As I have outlined in the discussion above, RCE's engagement with communities and their desires for community energy projects led to a change in RCE's mandate from providing affordable (diesel) power

to remote communities to providing affordable power to remote communities while meeting 50% of the demand in these communities with community renewable energy projects. Of course, BC Hydro did not do this out of shear good will. As the BC Hydro representative quoted in the interview above suggests, many of the communities that they approached were simply not interested in BC Hydro service, despite its promise to reduce costs to communities. In fact in the 6 years that RCE was in operation, they managed to bring a total of 6 communities under their umbrella[5], more than half of which already had their own renewable energy projects on the go.

For these communities -Tsay Keh among them- the RCE program became a framework for the integration of the various energy efforts in the community. And the shift in RCE's position to include a 50% renewable goal, even if ultimately more discursive than material[6], represented one of the ways in which the community energy discourse challenged the larger paradigm of which BC Hydro is a representative. Of course, in remote communities with no access to the electricity grid, the entire operation of that paradigm should be inapplicable, but as I will discuss, the BC Hydro of today, even in remote communities, continues to function as an artefact of that paradigm of energy planning — a fact that was revealed through the interaction of the two entities around Tsay Keh's community energy project development.

BC Hydro's involvement in Tsay Keh's energy project development, redefined the parameters of the space in which the project was being developed. In Tsay Keh, this new arrangement meant that BC Hydro would become responsible for the provision of electricity in the community through the operation of the diesel generators and the community grid. As Figure 5.2, shows, through RCE, BC Hydro would generate power that costs about 55 cents/kWhr and sell it to the community at a rate equivalent to rural BC rates, which is subsidized by BC rate payers as well as the pre-existing INAC subsidies. As Figure 5.3 shows, the community's own biomass project, if it were to become operational, would sell its generated electricity to BC Hydro at the avoided cost of diesel (that is the money BC Hydro would save by not burning the diesel required to produce the equivalent amount of electricity - about 30 cents/kWhr). BC Hydro would then sell electricity to the community at rural BC rates (11 cents a kWhr at the time).

[5]In that same time period RCE connected 5 other communities to the BC provincial grid. However the grid connection of these communities were part of settlement negotiations between the government of British Columbia and these communities. In the case of these communities, RCE was merely the mechanism used for the grid connection of these communities.

[6]None of those community energy projects have actually materialized.

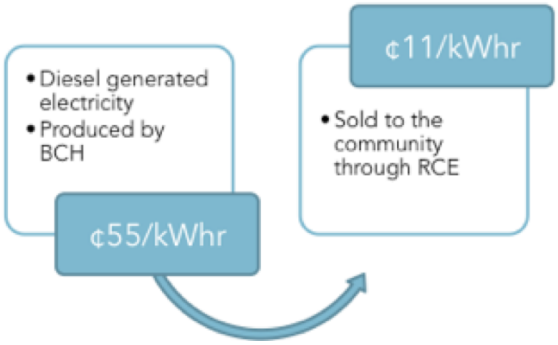

Figure 5.2: Electricity transactions under RCE

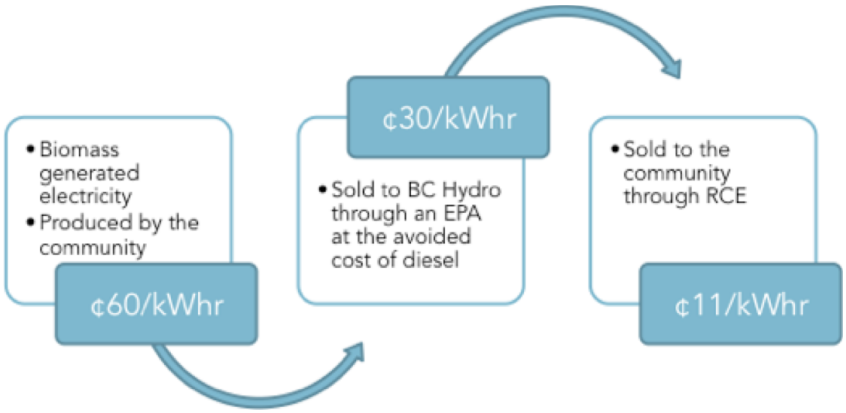

Figure 5.3: Electricity transactions with the community biomass project and RCE. Note that the reported values of 60 and 30 cents/kwhr are average values used for purposes of preliminary calculations. Actual EPA terms are confidential, where EPAs exist.

The terms of this series of transactions were sometimes pre-legislated, often contested and for the most part always in the process of being (re)negotiated. The contestations around the inclusion of renewable projects as part of RCE discussions, in fact, led to defining these transactions in the first place. It is through these negotiations and contestations that the two trajectories of power development relationally defined themselves and each other as competing processes. Next, I will explore the issue of demand projection in the meeting of these two trajectories.

5.3.4 Demand projections

After the initial contestations around the inclusion of renewable projects in RCE discussions, the next set of contestations in Tsay Keh's project occurred around the issue of energy demand projection. The community energy project team, in this space, contested the utility's future projections, which allowed

for a community growth of 1% per year beyond 2010 on the basis of historic growth rates (BC Hydro, 2010). The project team took issue with these projections, arguing that it took account of neither the new direction of installing electric heating and hot water heaters in future community housing developments nor the possibility of any economic growth in the community.

For example, BC Hydro's Community Electricity Plan document, developed in 2010, projects a community residential consumption of 888 MWhr annually in 2013, where the community project estimate, even after reducing the potential for electric heating growth in older homes, reports a figure 50% larger for that year, at 1348 MWhr/year (BC Hydro, 2010; Wilson, 2013). The main source of discrepancy between the two estimates is the question of 'fuel switching', or in this case, a changing of home and water heating practice from those that use wood or propane in favour of those that use electricity. There are several strong arguments for expecting this change in household practices, the most important of which is the explicit policy of the Nation to install baseboard electric heating, and electric water heating in all its new housing developments.

When Chief Izony explained the Nation's motivations for this change in policy to me in 2013, he mentioned the burden of paying for propane on community households, and the "inconvenience" of not being able to cook and shower for households that run out of propane and can't afford to buy more. In this sense, planning for this fuel switching was imminently linked to eliminating some of the most perverse manifestations of energy poverty in Tsay Keh, as I have described in the previous chapter. The difference between the two electricity consumption estimates is, in fact, almost entirely due to accounting for the increased electricity demand associated with this policy in new housing construction. In contrast, the estimates for non-residential electricity demand in the village are fairly consistent between the two reports.

This discrepancy between the residential consumption estimates came to head in the negotiations around and energy purchase agreement. As the final community project report summarizes, on July 12th, 2012 a formal proposal for an EPA was submitted to the RCE group, whom on July 31st, responded with concerns over the technical feasibility of the proposal, demanding a third party review.

In August of 2012, the community project team met with the RCE team to discuss these concerns. The community project's final report summarizes this meeting as follows :

> At the meeting the question of the electricity load forecast was raised and BC Hydro stated

> that they would only sign an EPA for the existing electricity consumption in the village, and that they would not accept the "artificial" fuel switch to electric heating as described in the proposal (Wilson, 2013, p.13).

Of course, BC Hydro's own earlier report anticipated fuel switching and discussed it as a "liability" for BC Hydro. It then, went on to state their generator sizing policy which takes account of only "the needs of the present and reasonably anticipated customer load" (BC Hydro, 2010, p.21). This deeming "artificial" or to use the language of their policy "unreasonable" a change in energy using practices which, in this case, is literally built into the infrastructure of the place, not only signifies an unwillingness on the part of BC Hydro to consider the community's plans for growth in housing infrastructure by disregarding the implications of their preferred direction of growth on energy demand (i.e. the use of electric hot water and heating), but also has important implications for the viability of a community energy project.

In a remote community setting with no access to the electricity grid, the potential revenues of a project is imminently linked to local consumption. In other words, the inability to sell excess generation on to a grid means that revenues from any community energy project is limited to what the community consumes. Economies of scale work against communities whose demand is too small, and when demand is not allowed to change shape -from relying on propane for heating to electricity, in this case- the choice of technologies to meet this small demand becomes restricted to only those technologies that are specifically designed for meeting very small demands. This, along with some other demands of the paradigm of energy provision that BC Hydro espouses, as I will discuss below, affect the economic viability of Tsay Keh's project in profound ways.

5.3.5 Reliability

Another area of contestation between the two trajectories was the issue of "reliability". Reliability became a flashpoint in the negotiations between the two camps relatively early on. For example, in the project initiation meeting, on February 9th, 2012, BC Hydro discussed the contingency of an Energy Purchase Agreement on the community project's technology of choice meeting its reliability criteria (Wilson, 2013). Reliability, BC Hydro insisted at the time, can only be demonstrated by the proven track record of the same system operating elsewhere. BC Hydro defines 'proven technologies' for purposes of their electricity purchase decisions as follows:

> The technology is readily available in commercial markets and is in commercial use (not demonstration use only), as evidenced by at least three generation plants generating energy for a period of not less than three years, to a standard of reliability generally required by good utility practice. (BC Hydro, 2008, p.9)

The implication of this definition for remote community energy projects, firstly, is that no truly novel arrangement can be used. In some ways, this is a reasonable requirement. Maintaining an untested system in a remote community is costly and difficult and chances of failure are higher. Of course, an EPA does not make BC Hydro responsible, in any way, for the operation and maintenance of the system. The bulk of the responsibility -and the burden of becoming a testing ground for a new technology- remains with the community. BC Hydro, however, bears the risk of planning on purchasing power from a third party and not developing enough generation capacity of its own but remaining responsible for providing adequate power regardless of the performance of this third party generator.

But BC Hydro already accounts for this risk in the EPA terms that specifically deal with the price of the power purchased. As I have already described, in EPA discussions with remote communities as part of RCE, BC Hydro indicated that if communities were to develop their own power projects, it would purchase power from them at the avoided cost of diesel. As I have discussed before, the avoided cost of diesel takes into account only the major operational costs of producing electricity —namely, the fuel. That is to say, it accounts only for the cost of diesel associated with producing a single unit of electricity. What it does not account for is the capital cost associated with securing an appropriate amount of generation capacity. In other words, using the avoided cost of diesel implies that purchasing power from the community energy project makes no difference in BC Hydro's calculus of determining how much generation capacity to develop.

BC Hydro would truly face risks from purchasing energy from a technology that it deems unproven, if it were using the avoided levelized cost of electricity (closer to 50/kWhr than 30/kWhr for diesel generation electricity) in its EPA negotiations — that is, if BC Hydro was planning on buying a smaller generator or fewer generators to meet the community's demand because it was planning on relying on the community energy project for supplementing the generation capacity of its own generators. As things stood in Tsay Keh, BC Hydro was planning on buying enough diesel generation capacity to meet the entire demand of the village (and its own redundancy requirements)[7]. That means regardless of what

[7]This purchase was funded by INAC

happened with the community energy project, BC Hydro would be able to meet all of the demand and if the community project was successful, BC Hydro would purchase electricity from the community energy project and pay the community project the amount of money it would save from not burning diesel.

All this is to say that BC Hydro is already accounting for the risks associated with purchasing power from an 'unproven' technology. In insisting on applying its general power purchase policies -developed in the context of on-grid power purchases- to the context of off-grid power purchase negotiations, BC Hydro is failing to consider the unique circumstances of Tsay Keh and in some ways, double counting its risk. What's more, it is imposing even more constraints, on an already constraint technological selection process. For Tsay Keh's project, this meant that the 300 kWe CPC gasification technology that formed the basis of its initial proposal would not be eligible for an EPA with BC Hydro — but that an Organic Rankin Cycle (ORC) system would be (Wilson, 2013).

The CPC system was constituted of multiple 150kWe units. Three of these units would cover the redundancy standards of BCH and provide room for growth. The ORC system, on the other hand, came as a much larger system. And while 300kWe units were available in Europe, they were not available in North America. The project team, therefore, had to design their project around a 600+kWe unit. Using this much larger ORC system, rather than the CPC gasification system proposed earlier, increased the capital costs of the project dramatically. By the time, all the various requirements of the project were addressed in the design, the initial proposed price tag of $3.3M had grown to $12M (Wilson, 2013; Tsay Keh Dene, 2010)— the largest part of this increase due to the change in technology from a gasification to an ORC system.

Of course, concerns over the reliability of proposed technologies are entirely legitimate (though, maybe not for BC Hydro in this context, as I have argued). However, reliability discussions in this context need to take account of the particularities of the situation. One such particularity already alluded to is the combination of lack of access to the grid and the small size of the community's electricity demand (paired with the fact that heat from ORC system was not usable in Tsay Keh, because of the geographical dispersion of the houses). This combination of circumstances is somewhat unique. Energy solutions for these kinds of contexts, indeed, must be developed specifically for these contexts and must engage with notions of reliability and demonstrated performance specific to these contexts. As this discussion has revealed, many of BC Hydro's positions in its negotiations with the community energy

project team suggest a lack of appreciation for the particularities of the context and can be read as the insistent application of the paradigm of power provision which begat BC Hydro to a situation which demands a fundamentally different approach.

Another area of tension around issues of reliability between the community and BC Hydro arose when BC Hydro decided to replace the community's existing generators with new ones as part of the RCE program. This decision to spend approximately $3M on buying new generators was justified by BC Hydro on reliability grounds. They wanted none of the risks and liabilities of old generators and therefore negotiated with INAC to upgrade the community's energy infrastructure all together as part of the RCE take over. This decision, however, seemed suspect both on the part of community administrators and the community energy project team. It seemed to them that prioritizing new upgrades over the many other needs of the community (including the community's own energy project) was yet another instant of the siloed approach taken to energy planning, as well as planning for community needs more broadly. To explore this issue, during my fieldwork, I asked people explicitly about their views on the performance of their current generators from a reliability perspective and about competing areas of priority.

With regards to the performance of their current generators, people in Tsay Keh overwhelming found the performance of their current generators satisfactory, and more importantly, consistently ranked other areas of priority with equal implementation costs to replacing generators, such as building a water treatment facility or the provision of free propane for residents for the next 20 years, as more pressing needs. Furthermore, electricity that is as reliable as it is in on-grid contexts was the option that garnered the most number of low or not at all' priority rankings along with the cash handout option, as Table 5.1, below, summarizes.

Here, again, BC Hydro's energy planning processes, along with INAC's siloed approach to planning for community needs, fail to foreground the needs of the community. In double counting risks of what they deem 'unproven technologies' and the insistence on purchasing new and unnecessary generators at the expense of more meaningful things to the community, BC Hydro insists on applying notions of reliability, risk and 'proven performance' inherited from its on-grid developments to an off-grid setting. In doing so, BC Hydro makes the range of technologies available for this setting from a very small selection of technologies to one, with a rather large price tag, in effect, making the project impossible.

	High or very high	Medium	Low or not at all	NA
Water treatment facility	81%	5%	10%	5%
Free propane to residents for the next 20 years	69%	10%	19%	2%
40K to each household	62%	10%	21%	7%
Electricity that is as reliable as the supply in Prince George	60%	17%	21%	2%
A pool and recreation centre	14%	74%	12%	0%
Weekly doctor visits for the next 20 years	12%	71%	17%	0%

Table 5.1: Rating of priority developments with equal cost as the purchase of new generators for the community

5.4 Lessons from engagement

In the space of Tsay Keh's energy project development and negotiations, several characteristics of the two paradigms that came into contact are revealed through their collisions over flashpoint issues. In fact, the very notion that there are two paradigms of energy planning in collision in this space, rather than merely two entities representing different sets of interests is born out of the revelations of this process of engagement. I have identified three flashpoint issues in my description of the engagement process between the two entities: the inclusion of renewables, the issue of future load projections and the notions of reliability at play. It is the positions of each of the entities on these flashpoint issues that defines the paradigmatic characteristics of each of the two entities.

The 'old' paradigm of centralized energy planning, to which large dams like the WAC Bennett dam belong, relies on large energy generation facilities often miles away from much smaller sites of consumption. This geographical unpairing of the sites of generation and consumption, as well as the scales of generation and consumption is made possible through the grid which connects these large far away power plants with smaller consumers of electricity in different regions and municipalities. This system of energy planning and provision has produced specific understandings of the kinds of technologies that can be relied on for power provision both in terms of generation capacity and reliability (including what reliability in this kind of system means). In its specific regional interpretations, it has also created specific ways of estimating future demand and planning for the meeting of this projected

demand. In BC, as the first half of this chapter argued, the specific shape of this electricity planning regime is one that treats future industrial demand as a thing that is decoupled from existing demand projected into the future by the constant planning for industrial loads that do not materialize.

Community energy as part of a distributed generation paradigm, on the other hand, demands a different pairing of sites of consumption and generation — one that relies on a closer pairing of the two in terms of both geography and scale. As an energy justice project, which I have argued it is in Tsay Keh, community energy's foregrounding of community needs demands specific considerations for community's priorities in terms of future growth or degrowth. It should be no surprise, then, that the flashpoints of the meeting of these two paradigms would occur around questions of what kinds of technologies can be relied upon to produce electricity and how future demand is to be estimated and planned for. The tensions in the negotiations around Tsay Keh's energy project, as I have described above, are entirely symptomatic of the meeting of these two paradigms.

However, in many ways, it is genuinely surprising that these specific points of contention arise in the context of Tsay Keh's community energy project development, because the off-grid nature of Tsay Keh's energy systems should throw all of the assumptions and operating parameters of the centralized energy planning paradigm into question and obsolescence. That BC Hydro brings its expectations of appropriate technologies and notions of reliability to this context and insists on applying them to a fundamentally different situation (one that lacks the grid) would suggest an absurd reliance on the energy planning processes that create energy poverty in the first place — in this case, energy poverty in its manifestation as powerlessness (material and otherwise) in Tsay Keh.

But insistence on a relational reading of the paradigms of energy planning engaged in these negotiations reveals not only the characteristics of each in a static way, but also places where their engagements leave meaningful changes in either approach. One such change was the discursive embracing of renewable technologies by BC Hydro as part of RCE program. Another such impact eventually occurred around understandings of reliable, proven generation technologies. In January 2013, as the Final community project report outlines, BC Hydro informed the community energy project team of a newfound willingness to consider novel technologies in its EPA decisions in remote communities (Wilson, 2013).

By January 2013, however, the community project team and community administration had reached a decision to not further pursue the project due to the large financial risk that its $12M price tag posed to the community. In their final recommendation, in light of this new willingness to consider less proven

technologies, the community energy project team recommended considering a small-scale (45kWe) biomass gasification system from Germany. This is a technology also under consideration by the neighbouring community of Kwadacha and there are clear benefits to the two communities using the same technology in terms of developing local expertise around particular technologies for maintenance purposes.

Nevertheless, none of the RCE communities have succeeded in developing energy projects at the time of writing, so my assessment of how the engagement between the two trajectories of power development might have changed either trajectory is limited to discursive manoeuvring within the space of Tsay Keh's negotiations.

The interaction of the two paradigms in the space of Tsay Keh energy project negotiations, however, also reveals unexpected aspects of the community energy discourse. Much of the discussion here has been focused on BC Hydro's inflexibility around the technological specificity of providing power for a small, off-grid community- namely the particular points of tension that arose around notions of reliability and demonstrated performance as they relate to the perverse economies of scale which are at the core energy generation technologies. The flip side to this argument is that there are not many renewable technology options that could actually work in a situation like Tsay Keh's.

Outside of those with very small renewable generation capacity (of the kind that would be considered negligible in meeting communities' electricity demand), the only technology that has been used with any success at all in remote communities in BC are run-of-river technologies that attempt to supplement the diesel generators. Most others have not been able to deliver their promises in the constrained context of small, off-grid community power provision. This was certainly the case with the biomass technologies that were considered for Tsay Keh. The lead design engineer for the community energy project, explained this to me as follows: It got too big and too expensive. Because, in the end, there wasn't a technology that was small-enough and robust-enough for that scale of generation (Sonja Wilson, March 27, 2014). In other words, the project would have been feasible if the electricity demand in Tsay Keh was larger, or if there existed robust technologies that were a better match for the scale of electricity consumption in the village, generating smaller amounts of electricity. However, the particular demands of small generation capacity, 'proven' track record (as understood by BC Hydro) and the failure of BC Hydro in recognizing the specific challenges that these demands impose on community energy projects meant that Tsay Keh's project posed a large financial risk on the community and could not go ahead.

Renewable energy technologies and the community energy paradigm are said to herald a closer pairing of energy consumption and production (Calvert and Simandan, 2010), of producing new kinds of 'localisms' around energy. This is true to a certain extent, but it is also true, as this discussion has revealed that many renewable technologies rely on the grid, and struggle in its absence. Renewable technologies might create closer pairings of energy production and consumption, but their localism is not a closed one— it's an interconnected one. The infeasibility of Tsay Keh's energy project highlights the impossibility and problematics of the kind of community energy discourse that ignores the questions of interconnection, and in this sense takes for granted certain artefacts of the centralized energy planning paradigm.

The encounter between the community energy paradigm and the energy planning paradigm that BC Hydro employs in its power provisioning exposes the ways in which the state of energy poverty in Tsay Keh is maintained by the mainstream energy-planning paradigm, even when it attempts to engage materially and discursively with the alternative energy provision paradigm of community energy. This maintaining of the state of precarious energy access is accomplished in Tsay Keh through the resistances and inflexibility of BC Hydro in accommodating the needs of a community energy system in its planning practices. But this encounter also sheds light on the bigger question of just what is deemed legitimate electricity demand when planning for the provision of future demand. As I have demonstrated in the first half of this chapter, large-scale industrial electricity demand has historically (and as the discussions around Site C and LNG have suggested, contemporarily) been not only accommodated, but explicitly planned around, even when the possibility of it materializing has been tentative at best. Demand growth, in Tsay Keh, by contrast is capped at 1%, denying the Nation not only the possibility of increased economic activity, but even more importantly, the very material increase in electricity demand that comes with the concrete housing policy changes of implementing electrical heating and water heating appliances in new housing units. In this sense, one of the central tensions between the two paradigms is around the question of which needs are foregrounded in planning for the meeting of future electricity needs.

5.5 Conclusions

In this chapter, I have argued that energy poverty must be understood as a product of the systems of energy planning and provision that decide how energy is to be produced and distributed as well as

what constitutes legitimate needs. Discussing Tsay Keh's energy poverty as a product of this system, I have demonstrated in sections 5.1 and 5.2 of this chapter, that Tsay Keh's situation of precarious energy access has come about historically through the particular operations of BC's centralized energy provision paradigm.

This paradigm has historically been a case of, and served to further enable, resource extraction projects in the province's Northeast. During the time of the development of the energy facilities on the Peace and Columbia rivers (and more recently with the development of Site C dam), it has primarily planned on meeting industrial energy demand for industries that did not exist at the time of planning and often never materialized, thereby decoupling energy supply decisions from existing demand characteristics. Furthermore, during the time that the developments on Peace and Columbia rivers were planned and executed, it has done so with little to no public scrutiny and input, thus decoupling the power planning process from the publics. The planning and provision paradigm is, therefore, centralized, both in the sense that power is produced in large "centralized" facilities and that the power to make energy planning decisions is centralized with the state, and in this case to serve the interests of extractive capital.

This paradigm of energy planning has produced Tsay Keh's energy poverty in two ways: First, by flooding the lands and making impossible the land-based practices that enabled the survival of the Tsay Keh Dene people, it, as well as other concurrent colonial projects of the Canadian state, has foisted a condition of material poverty (of which energy poverty is a form) on people of Tsay Keh. This material poverty is exacerbated in the case of Tsay Keh's energy situation by the lack of access to the provincial electricity grid, which exposes the community to modes of access to energy services that are three or four times more expensive than equivalents available elsewhere in the province.

Secondly, the legacy of this energy planning paradigm has left the community with a sense of powerlessness over their energy decisions, as well as a sense of dependency on BC Hydro for access to labour markets and relief from material poverty. This manifestation of energy poverty in Tsay Keh is simultaneously a direct product of the historical patterns of energy development in Northeastern British Columbia and the current operations of BC Hydro's approach to energy planning in the space of its interactions with Tsay Keh's community energy project.

As I have outlined in section 5.3 of this chapter, Tsay Keh initiated the development of its own community energy project in 2008 aiming to address several manifestations of energy poverty at the

community level. The project aimed to generate revenues for the community through the sales of its electricity, thus reducing the burden of energy expenses. It also aimed to tackle the sense of powerlessness within the community by reclaiming the power of decision making over the community's energy future. In its use of the debris wood that collects on the Williston reservoir, as the community's elected Chief described to me, it also aimed to turn "something that was a negative in the community to a positive," addressing the legacies of resource extraction and colonialism in Tsay Keh territory.

The development of Tsay Keh's energy project was an opportunity for the foregrounding of the community's priorities and needs, and in doing so, employing an approach to energy planning which would counter the prevailing paradigm of which BC Hydro is emblematic. In addition to this project of material and political self-sufficiency for the community, additional priorities included plans for a growth in housing units in the community as well as the installation of electric heating in new housing developments to help reduce the burden of propane costs (as well as improve the economies of scale at play for the community energy project).

The negotiations with BC Hydro around the development of the community energy project, in the space of the Remote Community Electrification (RCE) program, represented the meeting of two energy planning paradigms in Tsay Keh — that of community energy and BC's particular version of the centralized energy planning paradigm. During the space of these negotiations, the two paradigms came head to head on three flash point issues: the inclusion of renewable community energy projects in the RCE program, discrepancies between demand projections of the community and BC Hydro (and questions of what demands were legitimate), and BC Hydro's application of notions of reliability from its on-grid power purchase practices.

On the first issue, BC communities succeeded, discursively, though ultimately not materially, at broadening the RCE mandate to include a 50% renewable generation goal in remote communities. Though, ultimately, the RCE program was cancelled and even in communities where RCE was completed, no renewable projects have yet materialized.

On the issue of demand projections, BC Hydro's insistence on rejecting the community's demand projections had implications for the choice of technologies that were available for the community energy project, as well representing a failure to foreground communities priorities, including tackling energy poverty in the community by reducing household reliance on expensive propane. Similarly, the application of the reliability criteria from on-grid contexts to Tsay Keh's off-grid context, further narrowed

the technology options available to the community project. The combination of BC Hydro's positions on these two flash point issues left the community energy project team with one technology option with a price tag of $12M, and an Energy Purchase Agreement insufficient to secure debt financing for such a large capital investment. This combination of constraints represented too large a financial risk for the community.

Ultimately, this account of the relationship between these energy planning and provision paradigms, reveal how Tsay Keh's energy poverty is historically produced and contemporarily maintained through the operation of a distinct energy planning and provision paradigm, even as it is countered by alternative paradigms that nonetheless reproduce certain aspects of it.

Chapter 6

Structural Problems

6.1 Introduction

As I suggested in the introductory chapter of this dissertation, the articulation of a mechanism by which the injustices being claimed can be remedied is an important part of a justice claim, or certainly, of making one actionable. Of course, the articulation of remedial approaches is challenging, time-consuming and in situations where systemic injustice is being claimed, often requires years of organizing by those affected before even the most cursory commitment to partake in such a conversation is secured from the system that perpetrates that injustice. It is, nonetheless, in such moments that policy makers attempt to engage with various justice claims in the hopes of addressing them.

While the previous chapter was in part focused on outlining one part of a community's attempt at addressing the injustices of their energy access situation, this chapter focuses on one policy tool often used to address energy poverty more broadly. Residential energy retrofit programs designed for low income energy users, or those who meet some definition of energy poverty, have become a common policy tool for improving the energy performance of housing units, thereby reducing energy consumption and therefore expenditure among households who spend a disproportionately large part of their income on meeting their energy needs. This policy tool, of course, is not one necessarily designed by those affected. It is, rather, often a technically designed policy instrument with little input from those that it attempts to help. This chapter aims to contribute some perspectives derived from doing on-the-ground ethnographic work on the delivery of energy efficiency programs to inform such policies.

Beginning with a review of the literature on residential housing retrofits as means of addressing en-

ergy poverty, this chapter goes on to evaluate the effectiveness of one such program in reducing energy use and expenditure, improving household comfort or addressing energy poverty along a different dimension of the experience in Musqueam. This study was born out of a multi-year collaboration with the Housing Department at Musqueam and evaluates the only energy efficiency program in BC designed for low income energy customers, namely, BC Hydro and Fortis BC's Energy Conservation Assistance Program (ECAP).

6.2 Insights from the residential retrofit literature

Residential energy retrofits focus on the upgrading of the building envelope, systems and controls with the aim of improving the energy performance of the building. Common measures include draft proofing, increasing loft or attic insulation, upgrading windows, and installing more efficient appliances such as fridges, water heaters or light bulbs. Some residential energy retrofits programs also use the opportunity for what they call household education, which ranges from talking to inhabitants about how various household activities impacts their energy bills, to giving them personalized advice on what additional measures they can take to improve the energy performance of their houses.

While retrofits of older buildings with the purpose of improving their energy performance have been a mainstay of energy policy for about 40 years, beginning as part of conservation efforts in response to the energy crises of the 70s and 80s and later becoming a part of climate change mitigation policies (Lutzenhiser, 2014), some contend that the residential energy retrofit field is still an emerging one (William et al., 2014; Brown et al., 2014). One reason this assertion is made has to do with the fact that academic studies of energy retrofits frequently question the efficacy of retrofits, debating the cost of saving energy in programs that deliver energy retrofits (Joskow and Marron, 1992, 1993; Loughran and Kulick, 2004; Nadel, 1992) and pointing out vast discrepancies between reported calculated savings from such programs and actual savings associated with them (Hewett et al., 1986; Hong et al., 2006; Dowson et al., 2012; Rosenow and Galvin, 2013).

Actual savings from many energy retrofit projects appear to be less than calculated savings for several reasons. Low quality installations, lack of monitoring of the installation work, lack of monitoring of energy use before installations (and thus overestimating the pre-installation consumption), rebound effect, and the effects of free-riders are frequently cited as common reasons for this discrepancy.

The rebound effect, or Jevon's paradox - the idea that increasing efficiency of consumption does

not reduce consumption- certainly occupies a lot of academic attention. Various economists have estimated the degree of rebound for different classes of efficiency action. For residential energy efficiency upgrades Greening et al (2000) summarize the results of various studies into categories for lighting (5-12%), new appliances (0%), space heating (10-30%), space cooling (10-50%), and water heating(¡10-40%). However, many argue that in the case of energy efficiency upgrades for low income or energy poor folks, an explicit goal should be a raising of living room temperatures where they are too low for the maintenance of physiological function. In this sense, rebound is seen as a desirable outcome of such programs. In fact, the quantification of non-energy saving benefits (such as the increase in indoor temperatures) is, increasingly, suggested as important in the evaluation of such programs (Riggert et al., 2000), and several studies have attempted to quantify the temperature takeback phenomenon (Hamilton et al., 2011; Deurinck et al., 2012; Milne and Boardman, 2000).

Free-ridership is another area receiving considerable attention in the academic literature. Some (Loughran and Kulick, 2004) contend that failing to account for free-ridership can lead to an overestimation of energy savings by between 50 and 90 percent. While, increasingly, many others suggest that the effect of free-ridership is more than countered by the positive spill-over benefits and market transformation of energy retrofit programs (New York Energy Smart Program, 2005). For purposes of low-income energy efficiency programming, which is often income tested, the consensus among utilities is largely that the effect is negligible. However, I would like to point out that such assertions often rely on classist assumptions about lower income people and whether or not they procure CFL light bulbs on their own — assumptions that should be interrogated and verified at the very least. More importantly, where the issue of targeting has been explicitly investigated by looking at whether those who receive programs are merely low income or indeed in energy poverty, ineffective targeting appears to be a problem. Tom Sefton's work (2002), for example, shows that 75% of the recipients of UK's Warm Front program where actually not in fuel poverty.

While lack of monitoring and evaluation is increasingly receiving attention (Rosenow and Galvin, 2013) with evidence mounting in favour of actual energy metering in randomized control trials, the effect of low quality installation and lack of accountability in that work receives little attention. However, recent evaluations of the Warm Front program, again, note poor installation of loft and cavity wall insulation in 13 and 20% of the homes investigated, respectively.

There is also the larger problem of how in real life there does not appear to be as much saving

potential as many energy economics modellers have long suggested. In other words, the so-called energy efficiency gap (or the perceived difference between how much potential there is for saving energy and how much people actually save), which some claim is up to 23% of end use energy use for the US (Granade et al., 2009), in practice appears much smaller in the residential retrofit market (Metcalf and Hassett, 1999). A study of the potential for reducing residential energy consumption in Canada through housing retrofits, for example, finds this potential to be very small, between 0 and 8 percent (Guler et al., 2001). Furthermore, the authors find that most major upgrades are economically unfeasible with long payback periods of about 20 years. This finding is consistent with other work in this field, which often suggests that most of the activities that fall on the residential retrofit framework are economically unfeasible given current energy prices, and in most cases, upgrading appliances with new models only makes sense when they are ready to be replaced.

In addition to the uncertainties and problems that surround residential energy retrofits in general, programs designed specifically for low income people or those who meet some definition of energy poverty face a series of unique issues and challenges. These programs are often designed specifically to reach a demographic that is said to be unable to invest in energy efficiency and/or suffering from some of the consequences of being in energy poverty. In other words, these programs are sometimes specifically designed by governments to alleviate the effects of energy poverty (e.g. the warm front in the UK), and other times are designed by utility companies or third party agents as a consequence of mandates by governments to make energy efficiency accessible to lower income people (with the intention of closing the so-called energy efficiency gap, or reducing GHG emissions).

Regardless of intention these programs often run into several challenges, among which is locating these low income or vulnerable households and persuading them to partake in the program. In order to address this challenge, many programs have focused their efforts on social housing providers, with a literature documenting findings from research on this work in collaboration with universities. William et al (2014), for example find among key barriers in this sector is a lack of familiarity and knowledge with such retrofits in both housing providers and their supply chains. Brown et al (2014) report low levels of participation in retrofits due to the disruptiveness of the work to tenants, technological complexity and issues of trust in the provider — though issues such as lack of support in making this disruptiveness manageable, the intrusive nature of the work in the context of experiences of low income folks with judgmental and marginalizing structures that they interact with on a regular basis might also be explanatory

factors. In overcoming the challenges of locating and recruiting participants for such programs, several authors and institutions have recommended area-based and community-based approaches. Walker et al (2012), for example, have developed area based fuel poverty indices for Northern Ireland and Morris et al. (2015) have made a case for greater reliance on Local Authorities in the UK for delivering energy efficiency programs. While Reeves (2016) discusses the role of community based groups in increasing engagement and participation, as well as the limitations of these groups in terms of capacity, others, like the consumer organization *Which?* (2015) and Citizens Advice (2015) note that local and area-based approaches can lead to effective targeting of those in need, improved economies of scale, better synergies with other local initiatives and more flexibility in how local housing circumstances are addressed.

While there are few evaluations of energy efficiency programs designed for low-income and/or energy poor households that look at whether or not they actually make energy more accessible to these households, those that do exist tend to find increases in living room temperatures to varying degrees, and no or little reduction in energy use (Oreszczyn et al., 2006; Hong et al., 2009; Lloyd et al., 2008). Furthermore, this literature often finds such programs struggle with targeting those in energy poverty (Sovacool, 2015). This study aims to contribute to this small literature.

6.3 ECAP, an overview

In response to the 2007 Clean Energy Act which ultimately required the meeting of 66% of future resource needs through energy conservation by 2020, BC Hydro designed several demand-side management programs aimed at low-income households. Included under the umbrella of the Power Smart Low-income Household Program (PSLHP) these programs were namely the low-income Energy Savings Kit (ESK) and the more "ambitious" Energy Conservation Assistance Program (ECAP).

ECAP was designed to provide low income households with a home energy evaluation, the installation of the type of measures usually found in the ESK (CFL light bulbs, low-flow shower heads, etc), basic draft proofing assistance, personalized energy efficiency advice and for qualifying customers a new, more efficient refrigerator. The more advanced version of ECAP would add to this basic offering more comprehensive insulation upgrades. According to BC Hydro's own estimates 47% of all eligible low income customers would meet the requirements for this more advanced insulation work(Rebman and Li, 2012).

The program in its basic form was to be available to all those who met an electricity consumption

threshold of 8000 kWhr per year (effectively eliminating apartment buildings), and the Low-income Cut Off (LICO) established by Statistics Canada. The program commenced operation in 2009, with dismal participation — a total of 534 basic and 73 advanced deliveries (Fiscal year 2010). In the following year, while overall participation increased, the proportion of households receiving the advanced measures was even lower (see Table 6.1 below). As Table 6.1 shows, this proportion remains dismally low throughout the program life. Furthermore, these participation numbers suggest that over the first two years of its operation the program achieved only about 44% of the participation anticipated in its business case (this percentage is much lower at 9% for advanced retrofits delivered versus what was expected it in its business case)(Rebman and Li, 2012).

Fiscal year	2010	2011	2012	2013	2014	2015
Basic	534	1659			1148	1852
Advanced	73	60			62	38

Table 6.1: Participation in ECAP. Data from BC Hydro (Rebman and Li, 2012) the Proceedings of the BC Hydro Rate Design Application to the British Columbia Utilities Commission (British Columbia Utilities Comission, 2015, 1.135.7)

In 2012 Fortis BC joined ECAP, allowing gas-heated homes who were Fortis BC customers to qualify for the program as well. In that year Fortis' participation package only included draft proofing and insulation work in line with the basic and advanced streams of ECAP as offered by BC Hydro — but now non-electrically heated homes would also qualify. In subsequent years, high efficiency furnaces were also included for qualifying households.

The next changes to the administration of the program involved dropping the electricity consumption threshold from the qualification requirements, followed by changing the the low-income definition to LICOx1.3 in the DSM Regulation (B.C. Reg 141/2014). Again, as the numbers in Table 6.1 suggest, these changes do not seem to have solved the participation (and particularly advanced measures participation) problem of the program.

6.3.1 Program objectives

The Power Smart Low-income Household Program (PSLHP) was designed with several stated goals. According to BC Hydro's internal review of ECAP (Rebman and Li, 2012, viii), these were:

1. Make energy efficiency more accessible to low-income customers;

2. Provide energy savings for BC Hydro;
3. Provide low-income customers with energy efficient technologies that reduce energy consumption and lower utility bills;
4. Increase knowledge and awareness of energy efficiency among low-income customers.

A close reading of the objectives of the low-income DSM programming offered by BC Hydro would, indeed, suggest that BC Hydro designed these programs with the intention of providing energy savings for the Utility (rather than the customer) and on the customer side, providing knowledge, awareness and access to some energy efficient technologies (and not necessarily savings). In fact, when in 2011, I suggested a partnership to the ECAP program manager in the evaluation work that I was doing as part of this project on addressing energy poverty, I was told, repeatedly, that the program was not designed to address energy poverty — a point I did not yet appreciate.

Regardless of the stated objectives, and the repeated in-person statements on not aiming to address energy poverty, BC Hydro projects ECAP as a program designed with the customer in mind. In fact, when one of the intervenors (the British Columbia Old Age Pensioners' Organization) in the proceedings of the BC Utilities Commission on BC Hydro's 2015 Rate design application specifically asked about this, the following exchange took place:

> 1.109.14 Is the primary goal of ECAP to provide BC Hydro with energy savings, or is the primary goal to significantly reduce bills for low income customers who are having difficulty paying their electricity bills?
>
> Response: The goal of ECAP is to reduce energy consumption and lower bills for *low income customers* (emphasis added) (British Columbia Utilities Comission, 2015, 1.109.14).

While BC Hydro flip flops on what its objectives for ECAP are, this study, starting with the premise that such programs should help low-income people in reducing their bills, asks whether programs like ECAP, in fact, do reduce bills for low-income households and whether they are, indeed, productive ways of addressing energy poverty, as policy makers have assumed for many year.

6.4 Overview of our work in Musqueam

This 3-phase study was designed in collaboration with the Musqueam Housing department. Musqueam is a First Nation community whose traditional territory covers what is now Vancouver and its surround-

ing area. Today, the community occupies a small portion of their traditional territory near the mouth of the Fraser river, in what is known as the Musqueam Indian Reserve. In 2012, when the fieldwork for this study began, there were just over 200 households living on reserve (not including the lease lands).

In Phase 1, one hundred households in the community were surveyed to assess their access to energy, including assessments of self-reported thermal comfort, ability to pay bills, degree of worry about electricity and heating bills and physical characteristics of the dwelling along with the types of energy using practices that might have some bearing on energy use. Electricity use data were collected from old bills, or via electronic download from My Hydro, since BC Hydro would not agree to releasing data, even for customers who authorized it via a consent form. Gas use data were directly obtained from Fortis BC for all participants who signed consent forms authorizing us to do so.

This first phase was carried out with the help of two community research assistant — however, ultimately we created a part-time regular energy coordinator position who assisted with the remaining phases of the project.

During the second phase of the study, all qualifying households were invited to apply for ECAP. In case of First Nations communities, BC Hydro leaves the income verification step to the community, so all interested households who were on social assistance or would meet low income criteria were encouraged to apply at various community events. In effect, though, community income verification meant that a less strict measure of household vulnerability were used in determining eligibility and as a result some households who ultimately received ECAP self-reported higher incomes than LICO.

Households in our sample who were characterized as having a hard time in meeting energy needs were especially encouraged to apply. Households received help from the community energy coordinator in filling out the forms. Where followups were needed, the energy coordinator also performed this work, ensuring that applications were completed successfully.

BC Hydro's third party contractors, Quality Program Services, then, conducted the audits and retrofits. 81 households ended up receiving ECAP, with 9 qualifying for a new fridge and only one receiving advanced ECAP measures, namely blowing insulation into the attic. I went along for 12 of these audits/retrofits to observe the way that audits/retrofits were delivered and the interactions between the auditors and the households. My field notes from these visits constitute the data for the second phase of the study.

One common observation from the audits was that many households were not changing their fur-

nace filters regularly, so the Housing Department started a one-time program of providing free furnace filters for all community households in the hope of reminding households of the importance of regular furnace maintenance. The community energy coordinator, again, conducted this work, approaching all community households, regardless of their participation in ECAP.

In the third phase, I went back to the community one year after the audits/retrofits were performed and conducted interviews as well as surveys with households who had participated in ECAP and households who chose not to participate. This second category of households functioned as a sort of control group, against whom changes in the energy consumption of the first group was measured.

This second group is in some ways different from the first. For one thing, even when their incomes permitted participation in the program, they chose not to participate. For another, their incomes are generally higher (see Table 6.2). However, there is no statistically significant difference between the electricity use of the groups while the difference in their gas use might be marginally significant (See Table 6.3). Therefore, I use them as a "naturally occurring" control group, while accounting for any difference in their 'before ECAP' energy use an ANCOVA analysis. I use this naturally occurring control group, for several reasons: Firstly, I did not want to create an intentional control group, because withholding what was assumed to be a valuable program from low income households who would otherwise qualify for it seemed unethical. Furthermore, they function well as a control group in that they have been subject to the same "community engagement" as those who received ECAP, and also, by virtue of their inclusion in a 3-year study allow for isolating the effect of energy audits/retrofits as delivered through ECAP, and excluding Hawthorne's effect and the effect of community engagement which happened as a result of the study.

6.4.1 Objectives

I use the data collected in this study to evaluate ECAP across several indicators of performance reflecting ECAP's own stated objectives and those found in the literature. Firstly, I examine whether participation in ECAP results in a lowering of energy consumption (and bills). Secondly, I examine the "personalized advice" delivered during the course of the audits by reviewing the interactions between the auditor and households in the moment of delivery, and asking the households, a year later, if they remember any of the advice given to them. Thirdly, I review other impacts of ECAP as identified by households that participated in the program as well as those identified by the Housing department.

	No ECAP	ECAP
Less than $5,000/yr	12%	17%
$5,000 - $14,999/yr	8%	20%
$15,000 - $24,999/yr	12%	27%
$25,000 - $34,999/yr	19%	10%
$35,000 - $44,999/yr	19%	10%
$45,000 - $54,999/yr	4%	3%
More than $55,000/yr	23%	7%
NA	4%	7%

Table 6.2: Incomes for ECAP and Control groups

	Mean	Welch two sample t-statistic	p-value
	Electricity use (N=62)		
No ECAP	6279.2	0.2225	0.8249
ECAP	6105.5		
	Gas use (N=57)		
No ECAP	72.8	-1.759	0.08415
ECAP	92.3		

Table 6.3: Electricity and gas use for reference periods in 2011 for ECAP and Control groups

6.5 Energy poverty in Musqueam

Though this chapter is primarily an evaluation of ECAP, I want to start by giving a brief account of what energy poverty in Musqueam looks like. Much like chapter 4, this section is largely descriptive -though much less detailed- and in the context of this chapter, is meant to establish an understanding of the phenomenon that programs like ECAP should be attempting to address. I will, in brief, outline several manifestations of energy poverty in Musqueam revealed through the surveys as well as the ethnographic work I conducted in Musqueam.

6.5.1 Energy bills

Many households in Musqueam shoulder high energy burdens. Using the percentage of household income spent on energy bills as indicator of this burden, Table 6.4, below compares Musqueam to BC

and Canada. As the table suggests, the median household spending in Musqueam is almost 3 times the provincial median expenditure and over twice the national median. Of course, part of this problem is the fact that incomes in Musqueam are lower than provincial and national incomes, but equally important is the lower quality of housing on reserve.

Musqueam	Vancouver	BC	Canada
7.8%	2.1%	2.4%	2.9%

Table 6.4: Median values for percent of household income spent on energy services (The values for Vancouver, BC and Canada are from the 2011 cycle of Survey of Household Spending)

For many keeping the heat on is a priority above many other necessities of life, meaning that they keep paying the bills even though it consumes such large portions of their income. However, some experience disconnections and have to go without heat on occasion. Others, report turning off their furnace in winter and only using electric heaters. One household even reported not having gas for heating or water heating all winter and using electric heat and boiling water when needed.

These more extreme manifestations of energy poverty, of course, do not affect everyone in Musqueam. Depending on the measure used for the quantification of energy poverty, anywhere between 28 and 62% of the households in Musqueam experience energy poverty. The lower end of that range represents households that report never, rarely or sometimes finding their homes warm enough during the winter (see Figure 6.1), while the higher end represents the percentage of households in Musqueam whose expenditures on energy services amounts to more than 5.8% (or twice the national median) of their income.

The fact that there is such a large difference in estimates of energy poverty depending on the measure used indicates one of the problems with solely relying on one category of indicators. In Figure 6.2, a consensual measure of energy poverty (feeling warm at home) is contrasted with an expenditure based measure of energy poverty, while highlighting the influence of incomes above or below the low income cut-offs.

6.5.2 Psychological stress

When bills represent such large burdens on households, they also take a toll in the form of psychological stress. Figure 6.3, below, summarizes the results of a question I asked about how often folks worried

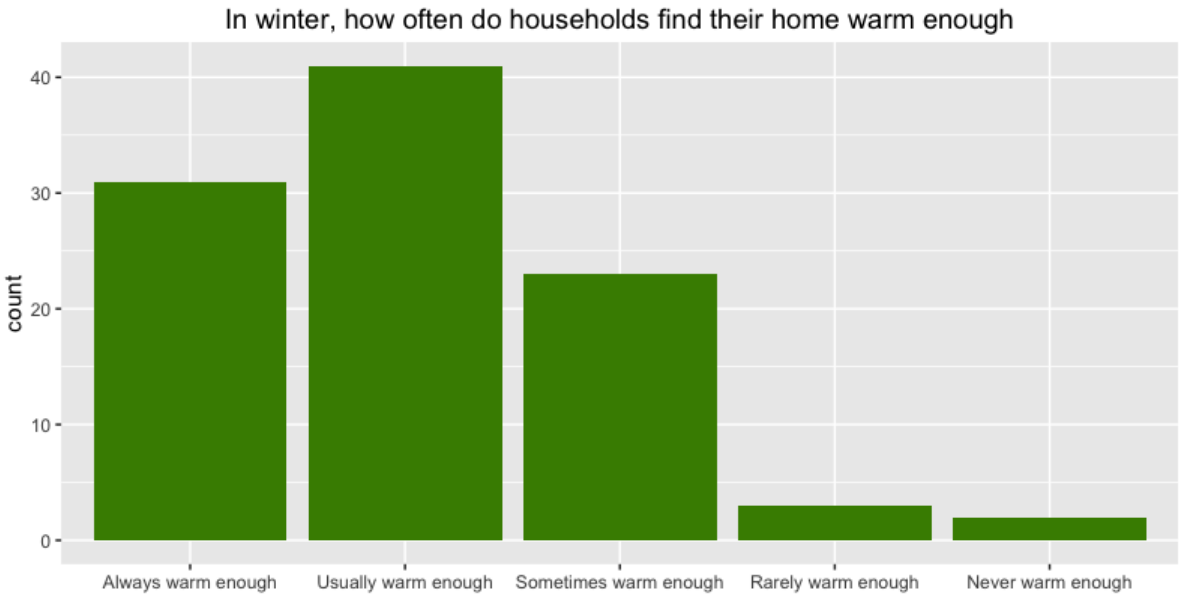

Figure 6.1: Finding one's home warm enough

about their energy bills, showing that 44% of households worry about their bills regularly (Always or Usually).

This worrying about energy bills and the possibility of disconnection is also reflected in the strategies that households adopt for paying their bills. Lucy, for example, explains how after she experienced a disconnection she started a habit of paying more than she is billed in order to avoid the possibility of a large bill when she does not have the money to pay it:

> I always pay extra. Always. And if we get Christmas money I always pay extra on every single bill. Just so that we'll have nice things to look forward to in the summer kind of thing
>
> Lucy, July 29, 2014

In fact, Lucy is not alone in adopting this strategies. Several households that I interviewed described similar approaches to staying on top of their bills, particularly when they are worried about large equalization payments, at the end of the year. Frederick, for example, explains:

> I used to get paid every two weeks, right? So, I just go to the bank and I take care of my utilities, my Hydro, my gas, and my phone. And then what I do…I just put whatever I can afford, like 50 down, 100 down. Every two weeks. Just so…Just a piece of mind. So, I know I'm trying to keep on top of it. So come winter, fall. Or whatever. It's not such a stressful thing. Cause things get a little more expensive during those seasons.
>
> Frederick, July 31, 2014

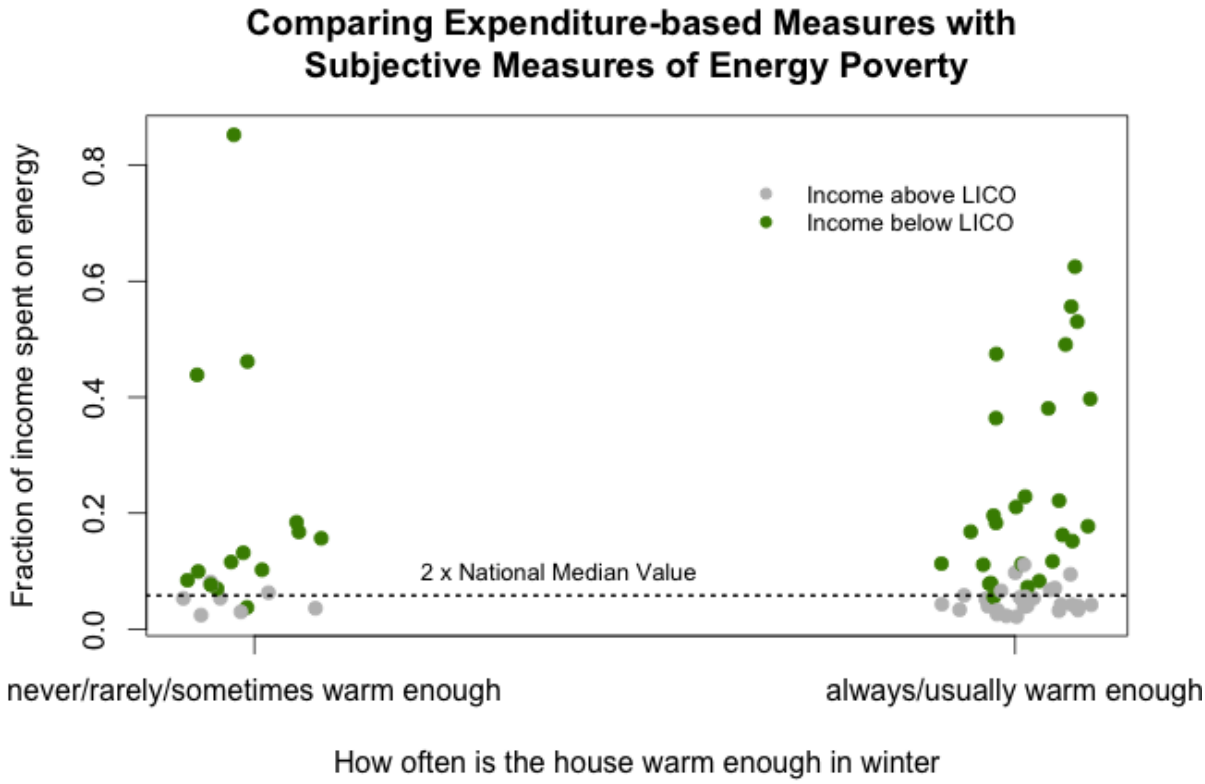

Figure 6.2: Energy poverty by indicator used

Other households manage this stress differently, still. Some of the households on social assistance, for example, reported, being scared to open their bills, and delivering the bills unopened to social assistance office to have them paid. While different households manage this stress in different ways, what these examples illustrate is that households in energy poverty experience a great deal of psychological stress.

6.5.3 Shame

Given the history of moralizing poverty, as I argued in chapter 3, there is an element of shame associated with some facets of the experience for many who experience energy poverty. In the case of energy poverty, in Musqueam this includes a range of experiences including the work that goes into the presentability of children and the performances of "good parent." Several of the households I interviewed, particularly those with small children, emphasized having to do multiple loads of laundry, often with hot water, and feeling bad about not saving energy, but also feeling stressed out about how their children might be perceived and how they themselves might be viewed as parents.

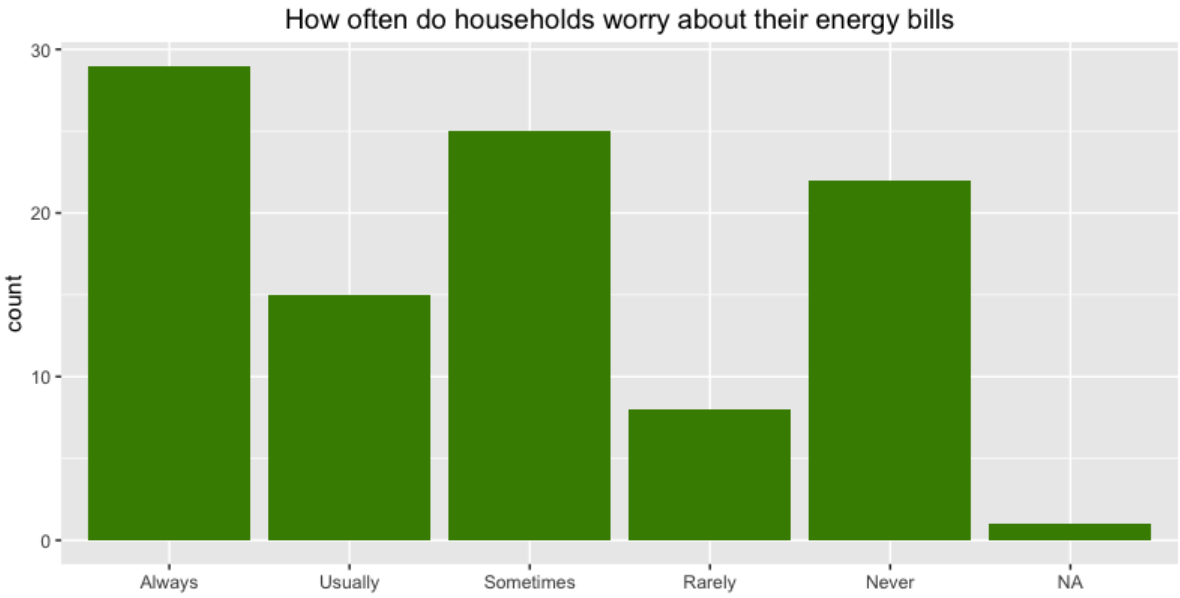

Figure 6.3: Psychological stress about utility bills

Shame around energy poverty can also be experienced in how one's home is viewed, particularly when this home has structural issues that contribute to cold and drafty homes, as I learnt in this interaction, while conducting surveys in Musqueam in 2012:

> I ask if they use curtains in winter for added insulation. She says 'never'. I check the box. But there is no box for her tone.
>
> She says 'never' with a tone that is indignant. It's a tone that says how dare you ask such a thing — of us. Her husband laughs and says you mean blankets, eh? I don't mean blankets. I didn't mean blankets when I designed the survey. I meant anything that covers windows and sills, adding insulation. But here I am, in a place where some people nail blankets to their walls, covering their windows. Not this couple, of course. But some. I explain that no, I don't mean blankets, specifically. He is still laughing. He says: "but you know the joke, right?" I don't know the joke. Though by now, I know where this is headed. "It goes: you might be red-skinned if you have blankets on your windows." She looks on, disapprovingly. I don't know if it is disapproving of me, or his telling me the "joke."
>
> Alice and Peter's house, April 30, 2012

For Alice, 'curtain' is a loaded word, closely connected to the practice of nailing blankets onto walls, which layers on more than insulation and includes understandings of class and race, of what's proper and what's shameful. Before I encounter Peter and Alice, of course, I've seen blankets nailed onto walls. A few people tell me it's for privacy. Many tell me it's to keep the draft out. But what's remarkable about Alice is that just before I ask the question about curtains, she has told me that she had

new windows put in her living room, but that they are poorly installed and there's always a draft coming through them. Still, given how curtain and blankets are implicated with shame brought on by years of living in racist and anti-poor society, she will not use them to protect her from the drafts in winter.

As the brief descriptive sections above indicate, the experience of energy poverty in Musqueam is multifaceted and manifests itself in a range of experiences, including financial hardship, inability to achieve thermal comfort, stress, and feelings of shame about conducting certain practices. Addressing energy poverty will, therefore, require policy makers to take account of these various experiences. The following section primarily focuses on whether ECAP successfully achieves any of its own laid out objectives, granting that some of those objectives do align with addressing the problems laid out above. However, I will return to the question of what kinds of programs may address these manifestations in a more comprehensive way in the final section of this chapter.

6.6 Evaluating ECAP

My evaluation of ECAP will first consider the impact of the program on reducing energy use and therefore energy expenditures. I will, then, examine its success in delivering energy efficiency advice, and lastly exploring aspects of the program that the community identified as valuable.

6.6.1 Energy use

In this section, I evaluate the changes in energy use before and after ECAP for both groups of program participants and those who did not participate in ECAP by looking at gas and electricity consumption separately.

Gas use

To evaluate the changes in gas consumption for the two groups, I chose a reference period from the beginning of April 2011 to the end of March 2012, before the audits/retrofits took place in the summer of 2012. Complete gas use data form 59 households in the two groups were available during this period. I used this data in conjunction with weather data, namely the Heating Degree Days[1](HDD) on a quarterly basis from Environment and Climate Canada, to estimate the parameters in Equation 6.1, below, for each house in the study:

$$G_{ist} = a_i + b_i \cdot HDD_{st} \tag{6.1}$$

[1]Heating degree days for any given day are the number of degrees, in mean temperature values, below 18 degrees C.

where i indexes the house, s indexes the billing or measurement period, and t indexes the year. G represents gas use, HDD the heating degree days and a and b are the intercept and slope of the regression line, respectively.

Then using the values for heating degree days for the same period in 2013-2014 and the values for the slope and intercept from Equation 6.1, I calculate "expected" gas use values for the evaluation period in 2013-2014. This calculation is, in effect, a weather correction performed on pre-ECAP gas use data. Total corrected annual gas use for the months between April and March is then compared to actual gas use data for this time period after audits and retrofits have taken place. I do this comparison using an ANCOVA style analysis that attempts to take into account any differences in pre-retrofit gas use, as described by Equation 6.2.

$$G_{after} = a + b_1 \cdot G_{before} + b_2 \cdot ECAP \tag{6.2}$$

Where $ECAP$ is a binary variable denoting participation in ECAP.

Figure 6.4, below, summarizes the results of this comparison for ECAP participants and the control group. As this Figure suggests, there might be differences between how high and low gas users responded to retrofits. However, the small sample does not allow for meaningful segmenting to investigate the differential behaviours of these groups. Regression parameters to the lines on Figure 6.4 are estimated for the slope and intercept parameters in Equation 6.2 and are summarized in Table 6.5, below.

Prameters	Estimate	p-value
Intercept	4.568	0.231
ECAP	2.402	0.484
Gas use before intervention	0.897	<2e-16***

Table 6.5: Coefficients from regression model described by Equation 6.2 (N=56)

These results suggest that overall, ECAP does not significantly change gas use for those who participate in it. In fact, it seems to result in overall higher gas uses for those who participated (see ECAP parameter value). That participation in a weatherization program should lead to no change in the use of heating is not surprising. In fact, the literature on rebound fully anticipates this phenomenon and offers quantitative estimates of its magnitude. This failure to reduce energy consumption through weatheriza-

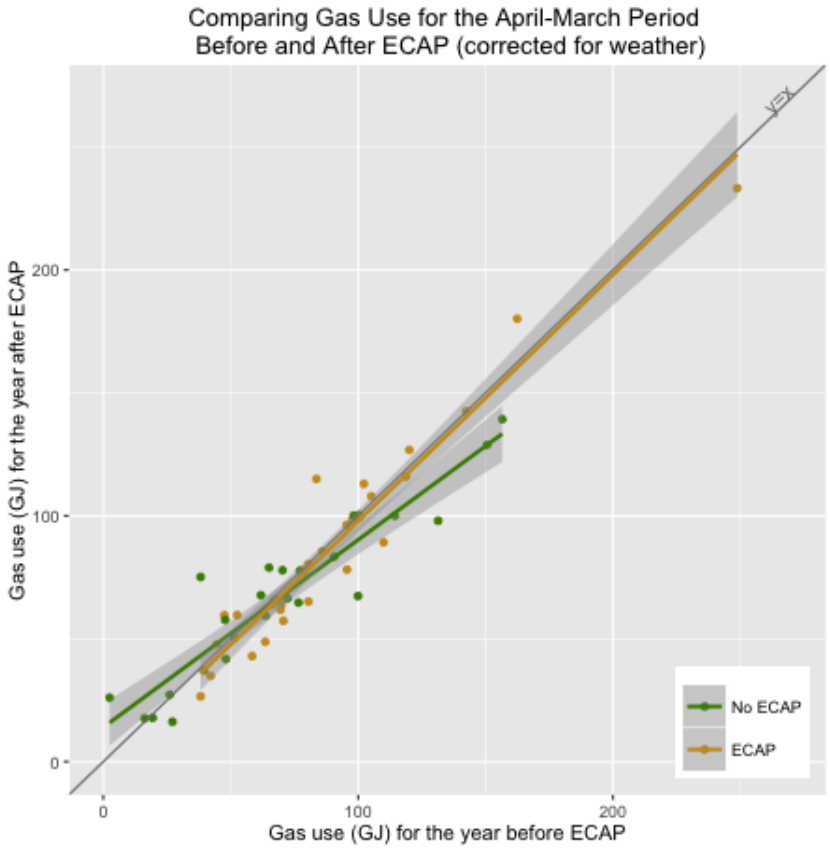

Figure 6.4: Weather-corrected gas use before and after ECAP

tion is primarily contributed to increases in thermostat set points. Sorrell et al (2009), in their review of the literature, suggest that this change in set point is between 0.14 to 1.6 degrees C. They also argue that this effect is particularly significant in the case households who might be experiencing energy poverty, and specifically living in colder homes. Milne and Boardman (2000) suggest that the pre-retrofit indoor temperature is an effective predictor of how much of possible savings in a retrofit program will be achieved. For example at temperatures as low as 14 degrees, they suggest that only half the savings may be realized, the rest taken as temperature increase. As this temperature rises to 16.5 degrees, they estimate 30% will be taken back and as it increases to 20 degrees the take back begins to diminish. Of course, these values are only applicable to the UK context where the social norms of indoor heating are different from North America. Given the preference for higher indoor temperatures in North American households, I would expect take backs at pre-retrofit temperatures of 14-16 degrees to be even higher, as well as the threshold beyond which thermostat take backs diminish.

There are few studies with experimental design that explicitly look at changes in heating fuel use

in the aftermath of weatherization work. However, where they exist, they report similar findings -both Heyman et all (2010) and Oreszczyn et al (2006) find no change in heating fuel use for households that participated in weatherization programs in the UK. However, both studies report modest increases in indoor temperatures. These findings have two implications for energy efficiency programming: 1) household energy retrofits do not represent a promising avenue for realizing energy savings and cutting greenhouse gas emissions, particularly in low-income settings. In other words, the synergies between addressing fuel poverty and climate change seem far more limited than some suggest; 2) effective low-income energy efficiency programs should explicitly include non-energy saving benefits, such as improvements in comfort or increases in indoor temperature, in their design, so while they fail to generate monetary savings for their participants, they can at least offer improved comfort.

Electricity use

As mentioned earlier, BC Hydro did not agree to release consumption information for consenting households in this study. I therefore, collected electricity use data for the household by collecting old bills,or downloading historic consumption values from BC Hydro's online interface for households that had My Hydro accounts. The period of time for which I was able to compile electricity use data for the majority of the households (53) is, therefore, shorter than a year. This reference period covers the winter before the retrofits, from October 2011 to March 2012.

Since most Musqueam households do not use electricity for heating or water heating, no weather correction is performed on electricity use values. Instead the ANCOVA performed compares the actual electricity use in the winter after retrofits to the electricity use the winter before retrofits for households that participated in ECAP and the control (see Equation 6.3). The results of this analysis are summarized in Table 6.6 and Figure 6.5.

$$E_{after} = a + b_1 \cdot E_{before} + b_2 \cdot ECAP \tag{6.3}$$

where E represents Electricity use during the reference period.

In the case of changes in electricity use, again, there is no statistically significant difference between the ECAP participants and the control group overall. However, the negative coefficient for the ECAP parameter does indicate the ECAP group reducing its electricity use over the control group. A larger

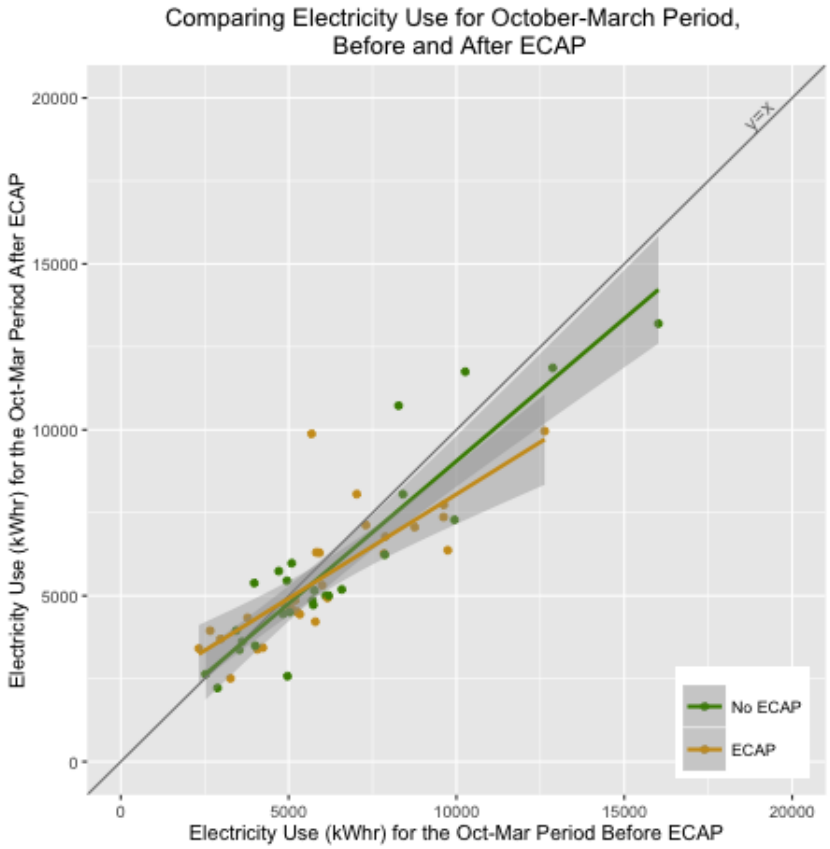

Figure 6.5: Electricity use before and after ECAP

Parameters	Intercept	p-value
Intercept	1031.973	0.027*
ECAP	-115.898	0.734
Electricity use before intervention	0.769	<2e-16***

Table 6.6: Coefficients from regression model described by Equation 6.3 (N=52)

sample, as well as access to more months of data, may indeed reveal statistically significant changes to electricity use in the aftermath of ECAP retrofits.

6.6.2 'So, Hydro recommends': energy advice

Delivering energy audits is hard. The work is intrusive. It makes people whose house is being audited feel like they are under a microscope. It's often inconvenient in that it requires them to be at home at a certain time or to make their attics accessible. These dynamics are often heightened when delivering audits to low-income households, where the operation of respectability politics requires certain perfor-

mances of "presentability" on the part of households. On the part of the individuals delivering the audits (certainly if they are to do their jobs well), delivering audits requires an extremely non-judgemental attitude when encountering lives that look vastly different from the life of the auditor and/or mainstream society.

Furthermore, when energy audits and retrofits are delivered in bulk by the housing provider, which is often the case when an agency attempts to deliver low-income energy audits but wants to make the challenges of recruitment easier, it often ends up including households that would not have volunteered for it — households that are somewhat coerced into participation. These households tend not to view the audit as favourably as those who voluntarily applied for it, thinking that it would do them some good.

The person delivering the audit/retrofit walks (intrudes) into people's lives having to manage these circumstances. Sometimes, particularly in the case of households who voluntarily apply for these types of programs, household members are curious and want to learn about the work. But more often than not, when an entire community is being audited/retrofitted, the attitude of the household is ambivalent. The delivery of audits and retrofits in Musqueam, as I mentioned before, certainly falls in this category of bulk applications. Bulk applications from social housing providers and First Nations, in fact, made up approximately 80% of ECAP deliveries in the early years of the program (British Columbia Utilities Comission, 2016, 2.332.1), making this by far the most common situation an ECAP auditor would encounter.

However, the literature on energy audits remains largely silent on the interpersonal dynamic between auditors and households. Some, like Brown et al (2014) have reported low participation in energy efficiency programming in the social housing sector even when programs are delivered for free. The authors attribute this low participation to the disruptiveness of process, distrust of housing and/or energy service provider, and the technological complexity of the measures implemented in energy efficiency program (Brown et al., 2014). But beyond this, little is said about the ways in which the delivery of energy audits and retrofits navigate these complex dynamics. The ability to effectively navigate the interactions with household members seems like an important part of audit delivery, particularly if one of the aims of the work is to deliver energy advice that householders may act on.

Delivering "personalized" energy efficiency advice is, as mentioned earlier, one of ECAP's goals. This personalized energy advice, however, comes from a drop down menu of several items on the app that the auditors use. As I go to audits with three different auditors, I hear less than a handful repeated

several times: *get rid of your extra freezer. Unplug electronics. Air or line dry your clothes.* Following them around, I get the sense that they do not think their own advice valuable or hesitate in delivering it to manage the intrusive, inconvenient nature of their work. One of them, Gerald, in fact, never delivers advice — instead he leaves the requisite pamphlets. Even that, on occasion, draws angry responses: "don't leave me your pamphlet unless they're going to help me fix my house" (Julie, June 27th, 2013).

John, while telling me how hard it is to get people to care about energy when they don't pay their own bills, does deliver energy advice to a person he assumes is on social assistance. He opens with "So a few things I noticed around your house" and goes on to list electronics that can be unplugged and how clothes can be line dried, while the homeowner listens on dismissively (John, June 18th, 2013). He, then, rejects John's pamphlet of energy saving tips, saying he can't read.

Jim, somewhat more attuned to how commenting on people's lives might sound like a judgment on their lifestyle, delivers his personalized advice while distancing himself from the advice. Still, it leads to uncomfortable interactions:

> Jim asks Penelope if she has a deep freeze. She says she does. Jim does some paper work, then says: "so, Hydro recommends swapping out your deep freeze." Penelope looks unsure. Jim explains that it's because it runs all the time and constantly switches on and off. It costs a lot running it. So, Hydro recommends getting rid of it. Penelope says there isn't much in the deep freeze right now, but that she likes shopping the sales. Jim makes a joke: "oh they won't come take it away." Penelope looks outraged: "take it away?" Jim goes into damage control mode, explaining that he himself has a deep freeze and that he just needs to make that recommendation because the point of all this work is to reduce Hydro bills.
>
> Penelope's house, June 5, 2013

Later, when he goes to make a recommendation about insulation levels he says: "I'm supposed to recommend R40, but the cost of getting another two inches is more than any savings" (Jim, June 5th, 2013), which in fact is why ECAP does not fund that particular upgrade.

Of course, not all interactions are as tense. Some householders listen along politely as their lives are commented upon. Others, watch TV or chat with the community energy coordinator who has come along to the audits, creating little space for interactions with the auditors. Still, while the auditors that I followed around were indeed respectful in their interactions with householders, they often ran into tense or uncomfortable situations when forced to deliver "advice". Jim and Gerald tried to avoid this commenting on peoples' lives, by either not delivering advice or by distancing themselves from it. John

charged ahead when he had an audience. Yet, an important question with respect to the effectiveness of this advice is whether or not households remember and act on this advice.

To get a sense of whether people remembered any of this personalized advice after the audits, I asked people if they had been given any advice or recommendation during the audits, if they remembered this advice and whether they had implemented any of those recommendations. I conducted 19 interviews with households who had received ECAP and as Figure 6.6 below, demonstrates, 11 did not remember any recommendation or advice, 2 reported that a different member of the household was present during the audit, and 6 mentioned specific things. However, looking at what was reported by these participants reveals that only two (or about 10%) remember any "personalized" advice, while the others either named changes that had been implemented during the audit or mentioned benefits of CFL lights (long lasting, energy saving), the latter of which does not constitute "personalized" advice.

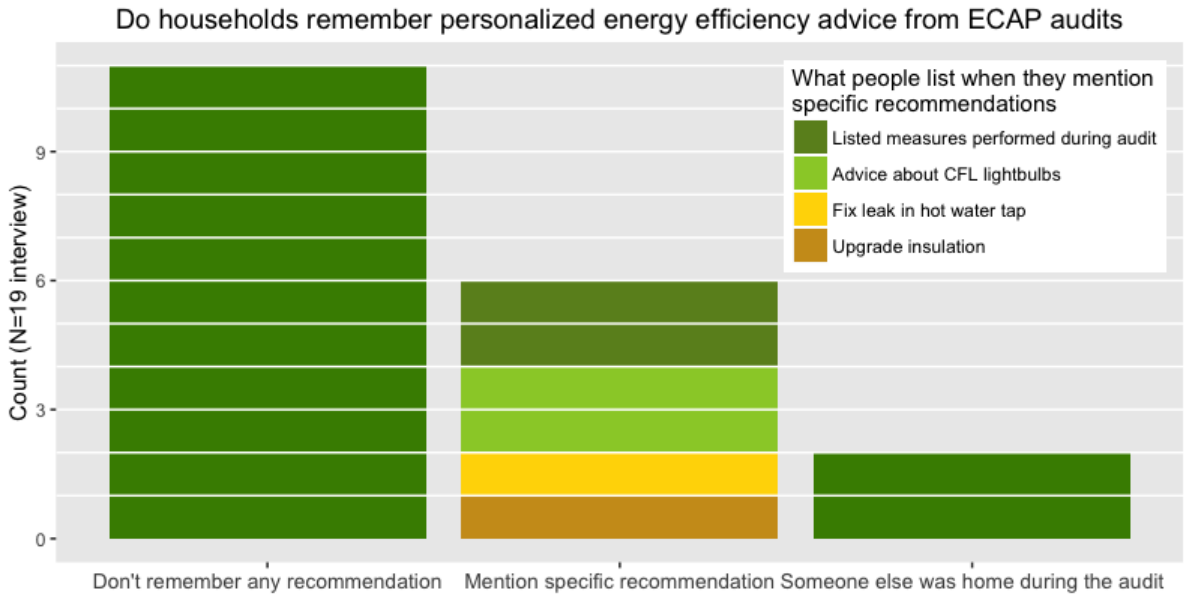

Figure 6.6: Recollections of advice received during audits

Furthermore, when asked if any of those recommendations were implemented, both those who remembered specific recommendations and those who did not, mentioned that they had thought these recommendations would be shared with the housing department who would be responsible for implementing them. This tension between households that believe their government responsible for the provision and maintenance of housing and neoliberal governance regimes that increasingly hold individuals responsible for services previously provided by governments is ever present at Musqueam both

when talking to individual members of the Nation and to the housing department and more broadly the administration of the Nation. Both housing managers[2], in fact, mentioned this as a 'problem' faced by the ECAP project:

> But I believe that the expectations of remedy of the problems in their homes were high. [...] we needed to keep the band members more informed of, this is how, this is what's happening, [...] this is not going to happen. Like, you need to be very detailed in explaining. So, I feel that was the department's fault that the band members weren't informed properly.
>
> Lorna Stewart, Current Housing Manager, September 6, 2014

However, regardless of what the role of the housing department should be in the maintenance of houses, policy makers design programs like ECAP precisely because they think low-income customers will not be able to invest in energy efficiency. What they hope to achieve by recommending energy efficiency measures which they themselves will not invest in because they're not economically viable is at best puzzling. This leaves the 'behavioural' category of energy advice, which without taking account of the dynamics between auditors and householders amounts to further judgmental comments on people's lives. In short, the audits and retrofits performed under ECAP fail to deliver meaningful and memorable personalized energy efficiency advice to the majority of the households that receive them. Certainly, in failing to account for the often difficult interpersonal dynamics between the auditor and household members, particularly for households that enter the program under "bulk application", ECAP renders its personalized energy efficiency advice a largely futile endeavour.

6.6.3 What's it good for, then?

I have so far detailed how ECAP has failed at both reducing energy consumption and delivering effective energy efficiency advice for Musqueam households, both goals set by the program itself. However, this is not to say that ECAP did absolutely nothing of value for households. In this section I discuss aspects of the program that the housing department and/or households found valuable about the program. However, I should mention that ECAP retrofits were part of a bigger suite of energy efficiency awareness and activity that took part in the community, led by the housing department as part of our collaborative

[2]During the 3.5 years that I worked on this project, there were four different housing managers at the head of the housing department. Two were only involved in the early discussions about project design and the next two managers, Catherine Talbot and Lorna Stewart were involved in the administration of ECAP. For context, I should mention that Lorna is a member of the Musqueam Nation, while Catherine is not. I conducted interviews with both during the post-ECAP evaluation work.

project. When the housing department comments on the successes of ECAP, it is ECAP within this wider range of activities that they comment on. This is particularly true of the class of benefits that the housing department calls education and awareness of energy use.

The housing department in Musqueam perceives there to be a gap in the knowledge of homeowners with regards to how household activities translate to energy consumption and energy bills. Both housing managers, therefore, stress how different aspects of our work on energy efficiency, including ECAP, have been a great opportunity to address this knowledge gap:

> We come from living in a longhouse to living in houses. I mean, yeah, the transition has been a long one but it's still the mentality. And [...] some of the band members don't understand that their bills are high —sky high, because of whatever they are doing or not doing in relation to conserving their energy, and their heat and all of that. (Lorna Stewart, Current Housing Manager, date?)
>
> Lorna Stewart, Current Housing Manager, September 6, 2014

This emphasis on education and awareness often ties in with the tension I mentioned earlier on whose responsibility it is/should be to provide and maintain housing. The housing department pushes an agenda of "increased self-reliance" for individual members of the Nation and intervenes to educate in ways that would enable that. During ECAP audits it came to light, for example, that many households were not changing their furnace filters on a regular basis. The housing department then rolled out a one-time campaign of providing households with a washable furnace filter, which the community energy coordinator delivered to every home, installed it, and talked to residents about maintaining their furnaces. The housing manager, sees this opportunity for education, as a positive outcome of ECAP and as a priority going forward:

> The majority of individuals don't know that they should be maintaining [the furnace]. Maybe they know more now. But historically they haven't maintained them. I mean, as you know, we found furnaces that were 30 years old and never had a filter in them. So just really promoting this and pushing this and the educational piece and keeping people interested. Is a barrier and an opportunity.
>
> Catherine Talbot, former Housing manager, July 21, 2014

The fact that the housing office sees the educational opportunities of ECAP as an avenue to pursue their own agenda of 'increased self-reliance' means that 'education' becomes a valued attribute of ECAP.

However, I want to point out, again, that some of this education is only made possible by the fact the housing department chooses to follow up on some aspects of the work ECAP performed.

Another class of benefits from ECAP, identified by both households that benefitted from it and the housing department, was the identification of structural problems which the housing department deemed important to address immediately. These predominantly included the identification of faults in the ventilation system, leading to poor air quality in the house.

During the ECAP audits, it was noted that in several of the houses the ducts vented out into the attic rather than outside the house. This meant that moisture was being carried from bathroom or kitchen fans into the attic and deposited there, increasing the risk of mould in that space. Several of the houses with this problem, were, in fact, new ones; completed in 2010 and still under warranty. For these houses, the identification of the problem enabled the housing department to have the builders come back and fix the ducts. For other older homes owned by the Nation the housing department repaired the problem at no cost to the residents.

The housing department also addressed a number of other issues flagged during the audits, including the installation of furnaces in a number of homes that had no working furnace. However, in these cases the housing department already knew of the problem and the audits played no role in informing a course of action beyond generally raising the profile of heating and ventilation issues in the community.

In the case of both education and awareness building activities and the identification of structural issues needing immediate repairs, the benefits of ECAP are only realized when there is a community organization (in this case the housing department) that acts on the recommendations of the audits collectively. Without this collective action, recommendations from audits face many of the same barriers to implementation that energy efficiency action in low-income households face in the first place.

As I mentioned in section 6.6.2, above, none of the households receiving ECAP had implemented any of its recommendations. Of course, as I outlined in that section, the manner in which the recommendations are delivered, as well as their ability to actually save households money has everything to do with whether the smaller, more actionable recommendations are acted upon. However, the recommendations requiring alteration to the built environment face additional barriers to implementation —namely the lack of monetary resources on the part of households to dedicate to implementing changes to the physical building and its heating and ventilation systems.

Making energy efficiency programs geared towards low-income customers successful can be ac-

complished through the coordination of the implementation of the recommended changes — preferably as part of the program itself, or in the case of many First Nation communities, a housing department that is willing and able to act on the information provided in the audits (and in this case, the housing department was enabled to carry out far more follow up work than is typically possible by virtue of the fact that our collaboration had a funded position for a community energy coordinator position). This is where the advanced stream of ECAP shows some promise by implementing the recommended insulation upgrades within the program, but the fact that only one house in Musqueam received the advanced stream suggests that the qualification criteria for it is set too high to benefit most low-income households, particularly those in the lower mainland, where the mild weather makes it difficult to for higher insulation levels to pass a financial viability test by utilities —in other words, the cost of upgrading insulation is often higher than any savings associated with the higher insulation level over the expected lifetime of the upgrade. However, households that start with low insulation levels due to poor quality construction choices continue to be penalized by paying higher energy costs. Programs that are serious about addressing high energy burdens on households should address the needs of this group of energy users. The following section is a brief discussion of the shifts in program design perspective required for programs like ECAP to do so.

6.7 Concluding thoughts on designing better ECAPs

In the preceding sections I have shown how ECAP fails to make a meaningful difference in the lives of those who receive the program —both failing at delivering energy efficiency advice and reducing energy consumption, goals that ECAP set for itself. In this section I take a step back and ask why this is the case and how ECAP can be improved.

During my field work, in addition to attending a number of audit/retrofit sessions, I also interviewed the management staff of the third-party company that administered ECAP at the time. During this interview I asked about their experience delivering ECAP and soon discovered that they found ECAP, particularly in the context of First Nations communities, as ineffective a project as I had. Areef, the company CEO, described working with ECAP as a "straight jacket" that did not allow addressing of real problems:

> But with [ECAP], I felt like we were working with a straight jacket on. So, we would go into the home and put weather-stripping on doors in houses where the windows were in a

> very poor state and leaking like nuts. There was nothing we could do about it. So I felt like I was delivering energy trinkets.
>
> Areef Abraham, QPS CEO, May 22, 2014

While ECAP delivers 'energy trinkets', the real problems of leaking windows, ducts that vent into the attic and other problems of poor construction continue to pose significant challenges to reducing energy use. One of the participants in this study describes the constant worry of having a home built on reserve, particularly in the context of energy use: "no matter how hard you try to oversee the construction of your house you still get an outdated furnace" (Bill, August 20, 2014)— a furnace that not only is not energy efficient, but quite often is manufactured several years prior to the construction of the house and has been sitting in a warehouse in the interim until a builder buys it for a discounted price.

What these comments allude to is the appalling status of housing in many First Nations communities, including Musqueam. In fact, 37% of First Nations homes require major repairs, while the limited housing funding that is available is often directed towards the construction of new homes since 94% of First Nations have long waiting lists for homes (Assembly of First Nations, 2013). The Kelowna accord, which was finalized in 2005 after an 18-month negotiation process between 4 indigenous organizations, the federal government and provincial governments, aimed at eradicating the persistent inequalities in life outcomes between indigenous and settler people in Canada, focuses on housing as a key site of inequality(Alcantara and Spicer, 2016). However, following the election of the Conservative government in 2006, the federal government dropped its commitment of 5.1 billion dollars over 5 years —30% of which would have gone to housing and infrastructure on reserve. The government continued to maintained the 2% funding cap to First Nations' budgets, which effectively has prevented Nations from addressing their infrastructure and housing gap[3].

The ventilation issues that were discovered during the course of the audits are hardly one-off issues — they were found in newer and older homes. Nor are they particular to Musqueam. For example, in a series of workshops looking at housing priorities for the Haisla Nation in Kitimat, McTavish et al (2011) encountered three poor installation practices reported by community members, one of which is the ventilation of kitchen and bathroom fans into the attic. The Assembly of First Nations (2013) reports that 50.9% of First Nations adults find mould in their homes (compared to 12.3% across Canada

[3]The cap was recently lifted in December 2015. But a large gap in infrastructure and housing remains to be bridged.

in 2011[4]). Poor construction quality and issues such as venting, leaky windows, and inadequate heating systems along with overcrowding are largely to blame for this moisture problem — which has a slew of associated health problems, such as asthma and other respiratory illnesses.

Both these issues —the chronic underfunding of the construction and maintenance of homes on reserves and the fact that what gets built is of poor quality— are part of a pattern of structural racism, which in addition to its implications for energy poverty and its associated health outcomes, have much further reaching implications for First Nations families and their life outcomes. Addressing energy poverty, on reserve, however, cannot proceed without a reckoning with the consistent underfunding of housing, addressing the absence of the building code on reserve and more importantly developing mechanisms for ensuring code compliance (both on-reserve and off-reserve) so that builders are held responsible for their construction work.

This raises important questions for the role energy efficiency has to play in the improvement of access to energy services. On the one hand, improving energy efficiency in a context of poor quality housing seems to be impossible without improving the house itself. On the other hand, the business of retrofitting homes to be more energy efficient has always been a 'housing' issue before a technology issue — In the UK, the country on which much energy efficiency work is focused, addressing energy poverty, improving home insulation from old buildings with little or no insulation requires major work on the "house" itself. Indeed, where energy efficiency work is seen to be effective at improving inhabitants' comfort, it makes significant changes in insulation levels, as well as heating systems (Heyman et al., 2010; Oreszczyn et al., 2006).

If programs like ECAP intend to move beyond delivering 'energy trinkets' and fulfill the promises of the program, they need to integrate the problems of housing into their solution delivery rather than walking away when such problems are encountered. What Musqueam considered worthwhile about the program, in the end, was essentially the recommendations that were acted upon. Knowing that housing departments often don't have the budget or capacity to act on recommendations, programs like ECAP would become far more effective if they delivered their own recommendations. This would require running a program that is much closer to the advanced ECAP.

As I mentioned in the introduction, ECAP (certainly the BC Hydro run part of ECAP) struggles with

[4]2013-06-20, "Households and the Environment Survey, 2011", http://hdl.handle.net.ezproxy.library.ubc.ca/11272/4PQNT UNF:5:AcddFITsEU/n2Bh3sFtH/g== V4

delivering the advanced stream of ECAP. In 2015, only 62 advanced ECAPs were delivered to electrically heated homes— a mere 5% of the total ECAP deliveries (British Columbia Utilities Comission, 2015, 1.135.7).However, even more importantly, though 10% of ECAP clients were First Nations community members in that year, no First Nation member received the advanced stream of ECAP (British Columbia Utilities Comission, 2015, 1.135.8). This certainly points to problems in the analysis that is used to define the criteria for the eligibility for advanced retrofits.

There is another important characteristic of the utilities approach to running ECAP that, I think, has hindered its ability to deliver meaningful results for low-income people in British Columbia. Program managers for ECAP at both utilities, but particularly Fortis which is a private utility company, seem to face a hostile environment and find themselves constantly advocating for the continued existence of ECAP. Unfortunately, this has meant that they have not taken serious steps towards the evaluation of the program and implementing changes when evaluations have suggested problems. No significant changes to ECAP has been made after BC Hydro conducted its own evaluation of the program in 2011, finding that a shockingly low percentage of advanced retrofits were delivered. In fact, when I asked for copies of this report, BC Hydro repeatedly refused to release it, saying that only the summary report which they had submitted to the Utilities Commission was available to the public. When the same report was requested as part of the proceedings before the utilities Commission, they, again, refused to release it — this time saying that it was not relevant to the proceedings. However, BC Hydro was ultimately ordered by the Utilities Commission to release the report. But this unwillingness to make public the result of the evaluation of a publicly funded program highlights BC Hydro's general culture around issues of transparency and unwillingness to engage with the inefficiencies of their programming.

Fortis BC seems to have an even bigger problem on this front. When in December of 2014 I presented the results of my work in Musqueam to both Fortis' and BC Hydro's program managers, I asked if any evaluations had been performed by Fortis on their program. It turned out that no evaluation had been conducted. When BC Hydro's program manager encouraged the Fortis program manage to do such an evaluation since they would have all the data already, the Fortis Program manager responded by saying that he was afraid the evaluation would show that the program wasn't doing well and he felt like he already had an exceptionally hard time advocating for this program to Fortis (the two of them must have forgotten that I was a researcher and that to me that interaction was data). Certainly a part of improving programs like ECAP would include changing this attitude towards evaluation work in both

organizations so that programs geared to low-incomes are no longer seen as 'charity' and are held to efficacy standards that they should.

Beyond ECAP

While improving housing quality and thermal comfort as well as reducing energy use remain key components of addressing energy poverty, as the section outlining the experience of energy poverty in Musqueam suggests (also see chapter 3), they are but a part of addressing the problems of precarious energy access. As I outlined in that section, living with precarious access to energy presents many anxieties around bill payments, disconnections and the rising cost of energy. Developing programs that address these aspects of the experience, therefore, remain crucially important. Beyond making ECAP a one-stop shop that tackles housing quality issues rather than walking away from them, three areas need specific attention:

1. Crisis management

   Many people who struggle with precarious energy access find themselves in occasional crisis moments, when they feel unable to make ends meet. The sense of crisis is particularly heightened in winter, when not paying energy bills means no heat. The allocation of crisis management funds for people who on occasion find themselves in this situation would help reducing some of the anxieties of those who face higher energy burdens. In 2013, Musqueam changed the way that social assistance funds were allocated towards rent and/or utility payments from a bills-first policy to a rent-first approach. The housing department pursued this approach since their rental arrears were preventing them from seeking additional funds (Catherine Talbot, July 21, 2014). Of course, this change meant that many utility bills for people on social assistance would go unpaid. In order to help low-income folks in the community, they established a one-time crisis assistance fund that would pay reconnection fees for people who were disconnected. A similar approach for all low-income and/or energy poor household in BC can reduce some of the stress and burden of living with precarious energy access. The fund should be applicable to both reconnection fees and bills themselves to prevent disconnection in the first place. Furthermore the suspension of disconnections during winter months would remove some of the stress associated with high energy burdens.

2. Easier and more flexible payment and reconnection options

   Many low-income people also struggle with a myriad of logistical challenges (beyond lack of funds) when it comes to paying for energy bills. Energy companies require large upfront security deposits for those with low credit scores, and make it exceptionally difficult to get on the equalization plan once there has been a disconnection. Furthermore, once disconnections occur, reconnections are often subject to large reconnection fees. Reconnection fees for BC Hydro have been reduced from $150 to $30 on an interim basis since December 2015. Making this change permanent, as well as establishing easier and more flexible low income rate rules, as the BC Public Interest Advocacy Coalition (BC PIAC) advocates, would go some ways towards improving access to energy. These include, waiving reconnection, late payment and security deposit fees for low income customers (BCPIAC).

3. Cost of energy

   Building better homes, significantly improving the energy performance of existing homes and establishing crisis management strategies for those who struggle with energy bills are important components of addressing the high burden of energy services. However, the increasing cost of energy, and the fact that it far outpaces income growth in BC remain large contributors to the problem of energy poverty. In fact, the increase in price of energy (and particularly electricity in BC) contributes far more to increasing energy burdens than improving energy efficiency can address.

   BC Hydro's own evaluation of ECAP Rebman:2012tu was conducted on electrically heated homes who would see an impact equivalent to the cumulative impact of both categories of energy use discussed here and using a considerably larger sample size. They do find a statistically significant difference between program participants and a randomly assigned never-contacted but regionally representative control group. They find an average 5.8% reduction in annual energy use for program participants relative to the control group. Even accepting this finding, it remains evident that these savings are insufficient to balance the impact of rising electricity prices in BC. In the past 3 years, for example, BC Hydro rates have gone up by 20%, and they're scheduled to continue to rise. A one-time decrease in energy consumption by 5% does little to counter the increases in energy bills, particularly when energy rate increases outpace increases in incomes, minimum

wage and social assistance rates.

Even more robust energy efficiency programs than ECAP cannot hope to counter the effect of such rate increases in BC. Others have observed similar processes elsewhere. Jenkins et al (2011), for example, suggests that

> Energy inefficiency is not the main driver of fuel poverty in the UK. The small changes in the efficiency of the UK stock over the last decade have had minimal impact on fuel poverty numbers. That is because this is driven by, in particular, gas prices (Jenkins et al., 2011, 25).

To treat energy poverty as a problem independent from energy policy and the regulation of energy utilities would be to ignore the largest contributors to the increasing magnitude of the problem.

While the variable price of natural gas has been declining in BC since 2009, many Fortis customers in Musqueam are locked in fixed-term contracts with third party gas marketers, which means they might not have seen the decline reflected in their energy bills. The BC Utilities commission has a convoluted process for launching a dispute or complaint against one of these natural gas marketers. The complexity of this process would discourage most customers from launching a complaint. However, most importantly, most customers do not know that the utilities commission oversees third-party marketers. On occasion BCUC does review third party marketers, and in such reviews it is often found that promotional material by the reviewed marketers are in violation of the Code of Conduct set by the Utilities Commission for such organizations. In addition, sales reps are often found to follow predatory practices, including forged documents, and aggressive behaviour. A more strict review process independent of customer complaints for all third-party marketers and making the results of these reviews easily available to customers would go some ways towards reducing predatory practices. Furthermore, customers should be advised (perhaps on their Fortis bill) that they can launch complaints or disputes against these marketers.

However, while the predatory practices of gas marketers affect some customers, most have been seeing declining gas prices on their bills. The bigger issue in BC continues to be the rising electricity prices, over which both the government and the Utilities Commission have control. As the Introduction chapter of this dissertation suggests, however, the government of BC's particular

approach to energy planning has important implications for both how the Utilities Commission can fulfill its role, and more importantly electricity prices in the province. I will expand on this idea in the Conclusions chapter of this dissertation.

To summarize, programs that address energy poverty in BC must firstly integrate more robust forms of evaluation in their design, and transfer their program delivery model from one that does 'charity' (and is, therefore, considered inherently good) to one that must deliver meaningful results for customers. The most important step towards making this goal a reality would be the expansion of ECAP or ECAP-like programs to something closer to the advanced ECAP. This shift must also include increased flexibility in program delivery, such that contractors can address housing deficiencies as they come across them, rather than walking away from them. The integration of such programs with federal or provincial efforts on mould remediation and housing improvement may help in securing additional funds and streamlining the delivery of various programs. Furthermore, should the Province take an interest in addressing energy poverty, it needs to implement crisis management mechanisms and develop payment rules and regulations specific to low-income customers. It should go without saying that raising welfare rates, the minimum wage and other poverty alleviation strategies would also enhance the lives of those who live in energy poverty. And most importantly, reconsidering BC's energy policy more broadly and restoring the Utility Commission's power to review prospective energy projects (such as site C) should be a priority for stabilizing electricity prices across the province.

Chapter 7

Conclusions

Energy poverty, or the experience of struggling to meet a household's energy needs, is increasingly the subject of attention in Canada. On the right, it is obliquely used to argue against taxes on energy, and more specifically taxes on carbon or policies that encourage renewable energy development (Fraser Institute, 2016; Green et al., 2016), while on the left, it is often, paradoxically, used to argue for action on climate change in the form of energy efficiency (Lee et al., 2011). However, besides its strategic use in arguing against carbon taxes or arguing on behalf of the energy efficiency industry, little attention is being paid to questions of how it manifests itself, who is affected by it, and more importantly how it is produced and reproduced by energy and housing policies.

This dissertation is primarily written in the spirit of exploring these questions. By adopting a justice framework which aims to link the experience of energy poverty with the processes that produce it, I have aimed not only to start a productive conversation on how we might think about energy poverty in Canada, but do so in a way that sees it as a product of specific practices of energy and resource development. However, given the state of discourse on energy poverty in Canada (one that lacks a robust analysis behind its claims), in Chapter 3, I have had to engage with questions of appropriate definitions and indicators, as well as identify broad patterns of energy access across all the territory and regulatory regimes that is southern Canada as a first step to more specific explorations in chapters 4, 5, and 6. These chapters collectively explore a past and present of energy and resource development regimes in BC, particularly as they relate to the creation of precarious energy access for some communities.

A key feature of this work is, then, its navigation across different scales of geographical and temporal analysis, as well as considering different units of analysis in the form of individuals, households and

communities. I do this with the belief that how one goes about defining a problem has everything to do with the kinds of solutions that one proposes to that problem (and justice is always solutions oriented, whether those solutions are reforms or revolutions). This belief would suggest that there is something to be gained from exploring energy poverty from different vantage points, particularly given that it was hitherto undefined and unexplored in Canada. And, indeed, different chapters of this dissertation reveal different facets of the experience of energy poverty, as well as different processes responsible for its creation.

Firstly, by exploring energy expenditures as fraction of net household income, I have defined an energy poverty threshold at twice the median percent expenditure value in southern Canada. This definition of energy poverty is essentially a relative definition, suggesting that those that spend more than twice the median percent expenditure on securing their energy needs face higher energy burdens. However, it should be noted that the median expenditure in Canada is quite low, at 2.9% of the household income, yielding an energy poverty threshold of 5.8%. At this threshold, 2.8 million Canadian household (21% of all households in Canada) are in energy poverty.

Next, while exploring broad patterns of energy poverty, I demonstrated that where a household lives seems to be a much more robust predictor of being in energy poverty than the sociodemographic groups a household may belong to. In fact, sociodemographic groups such as single parents, seniors and renters, who are commonly said to be more vulnerable to energy poverty face no statistically significant higher chances of being in energy poverty in Canada. Rather, households in the Maritimes, followed by those who live in Ontario and Alberta (provinces with deregulated or semi-deregulated energy markets) have significantly higher chances of being in energy poverty than, Quebec, BC and Manitoba.

Another significant insight from the statistical analysis was that while energy poverty overlaps with poverty (7% of Canadian households are both income and energy poor), there are differences between the two categories that warrant analytically treating energy poverty as a distinct problem. One key difference between those who are in poverty by income measures and those who are in energy poverty is often the type of house a household lives in, and its tenure. Many of those who are in poverty by income measures but do not face higher energy burdens live in rented apartment buildings, which tend to have lower heating needs, keeping energy expenditures manageable. Conversely, many households who are in energy poverty but are not considered in poverty by LICO measures, tend to be lower middle class and own their single detached homes (median annual household income in this group is a $44,000).

This observation should have important implications for the design of programs that aim to address energy poverty, not only through the answers it provides to the question of who should qualify for such programs, but also in delineating the the differential needs of each of these groups on matters of energy access.

However, this statistical analysis is inherently incomplete, for several reasons. Firstly, none of the recent available cycles of the Survey of Household spending has reliable data for energy expenditures in the northern territories. This omission distorts the picture of energy poverty painted to one only informed by the experiences of southern Canada. Furthermore, as the discussion in Chapter 6, and more specifically Figure 6.2, suggests there are large discrepancies between estimates of energy poverty derived from consensual/subjective measures (such as ability to keep warm) and expenditure-based measures. In Musqueam, for example, expenditure based measures yield and estimate of energy poverty which is twice as high as the one derived from subjective evaluations of ability to keep warm. While, this difference might not be as large when looked at nationally (Musqueam, and BC's lower mainland, enjoy very mild winters compared to the rest of Canada, so it's possible that while energy costs are a burden, keeping warm is less of an issue), it nonetheless represents an important gap in current analyses of energy poverty. One recommendation from this work is for Statistics Canada to consider the inclusion of some subjective measures of energy access in a relevant survey(perhaps the Household and Environment Survey).

To address another gap in the available data, namely the availability of energy use data on reserve, primary data collection work for this dissertation was focused on the experiences of two First Nations communities in British Columbia. I had several motivations for this focus: One such motivation was beginning the work of documenting inequalities in energy access for First Nations communities. Another, particularly with regards to working with 'remote' communities, was with regards to their unique place in networks of infrastructure (roads, pipelines, the electricity grid) — I was interested in how their particular geographies of inter/disconnection presented opportunities for investigating energy vulnerability beyond the household and as a problem faced by communities in networks of energy production and consumption. My work with Tsay Keh and Musqueam, therefore, emerged with these motivations in mind, as well as from ongoing relationships that my supervisor had cultivated with these communities. The projects that developed with each community represent each community's unique set of interests given their locations relative to networks of energy distribution. In Tsay Keh, without access to the elec-

tricity grid or natural gas network, the community was focused on developing its own energy project. In Musqueam, given its urban location and access to utility programming, we developed a project that sought to improve the energetic performance of housing units in the community. The insights from these projects offer complementary understandings of energy access in off and on-grid contexts in BC, as well as a unique discussion of how past and present energy and resource development policies of the government of British Columbia yield particular patterns of energy access for First Nations communities in BC.

One important discussion to emerge from the work in Tsay Keh was tracing the legacy of a particular regime of resource development, both in terms of its implications for provincial electricity planning and more importantly for patterns of access to energy in the province. Focusing on a twenty year period during which most of the hydro power in the province was developed, I outline an electricity planning regime that served to enable an agenda of 'industrialization by invitation' (Froschauer, 1999), where certain extractive industries were wooed by the province with promises of easy access to markets and cheap electricity, hoping that in return those industries would process more of the extracted resources in BC. The electricity planning regime emerging from this industrialization by invitation agenda had four key characteristics: 1) Not only were the hydro projects that followed resource extraction projects in themselves, but they served the larger agenda of extractive capital by both providing it with cheap electricity and improving the transportation of its extracted resources through their waterways; 2) As a result of its focus on attracting industries that did not yet exist (and often never materialized) it had energy forecasting practices that decoupled energy supply planning from actual energy demand; 3) Was developed without much input from the publics and/or independent review bodies; 4) Was highly centralized, both in its approach to planning (#3) and more importantly in provisioning power through large centralized hydro-electric facilities.

This electricity planning paradigm legitimized certain kinds of demand over others, while paired with invocations of 'terra nulius' arguments completely denied the existence of the indigenous people who, in the case of the WC Bennett dam, lived in the Rocky mountain trench and whose homes and lands were destroyed. This history of electricity planning is an important element in understanding energy access challenges in Tsay Keh. The present day of Tsay Keh energy access is very much coloured by this history, since the community who was displaced for the purpose of dam development in the late 60's remains without access to the electricity grid. One key argument that I put forward in this dissertation

is, in fact, that energy poverty, as with other forms of poverty, is not a purely material problem, and that employing a justice lens in its investigation will invite a recognition of how politics of energy use and access form key features of the experience. People in Tsay Keh understand their energy access situation as one that is entangled with that history of dam development, and the ensuing relationship between BC Hydro and the community. In this sense, a sort of powerlessness over the community's energy future, is indeed part of the particular experience of energy poverty in Tsay Keh.

At the household level, this recognition of the importance of the relationships governing energy access, reveals how the lack of access to labour markets in Tsay Keh, combined with Tsay Keh's particular arrangements around securing access to energy carriers such as electricity, wood and propane create manifestations of energy poverty, predominantly around practices that require hot water. Since the path of access to propane as an ingredient of practices that use hot water is, for most people in Tsay Keh, strictly mediated through market transactions and since there is often less flexibility in the infrastructure involved in heating water, hot-water-using practices represent the sites of most compromise in the successful performance of household activities. This making explicit the relationships of access to ingredients of practice, and demonstrating how the successful performance of these practices, as well as the meanings ascribed to them are related to these relationships, is one of the theoretical interventions of this dissertation.

Furthermore, in locating energy poverty in the failure to successfully perform household practices, or in having to compromise on comfort, convenience, cleanliness, I draw out the non-material implications of energy poverty. Households that struggle with securing access to energy services, not only struggle with any health implication persistent living in cold environments might have, but also contend with psychological stress over paying their energy bills (incidentally, women tended to report higher stress over energy bills), in having to divert time, funds and their own energies from other pursuits to securing access to the material necessities of life, and in some cases the stigmas associated with failing to perform household practices, and therefore the roles of competent adult/parent, etc.

Another important set of findings from this work pertains to the 'solutions' proposed for addressing energy poverty. One common policy tool for alleviating energy poverty is household energy efficiency programs. My work in Musqueam (Chapter 6) suggests that BC Hydro and Fortis BC's Energy Conservation Assistance Program (ECAP) fails at achieving any of its own stated goals for improving energy efficiency in low-income households. Furthermore, where research with an experimental design has

been conducted on the efficacy of these types of programs, it suggests that reducing heating fuel use (and therefore expenditures) is often not among their accomplishments (though improving comfort might be) (Heyman et al., 2010; Oreszczyn et al., 2006). What BC Hydro's own evaluation of ECAP suggests is that when savings are not split between electricity and heat (i.e. households that use electricity for heat are evaluated), there is a one-time 5.8% savings in energy use — a value that is dwarfed by the 20% increase in price of electricity in BC over the past 3 years.

This finding would suggest that energy efficiency programs are not promising avenues for addressing energy poverty. Rather, changes to processes that create energy poverty in the first place, should take priority, along with measures that aim to reduce the immediate burden of securing energy services for households. This dissertation highlights several processes that create energy poverty, including the energy planning processes that prioritize industrial energy demand at the expense of residential consumers who end up subsidizing the electricity use of this sector (in addition to BC's practice of reckless dam building for meeting industrial demand that does not exist, it's important to note that nearly everywhere in Canada, the price of electricity for industrial consumers is lower than the price paid by residential accounts). Furthermore, as the discussions in Chapters 3 and 6 suggest, housing quality plays an important role in determining whether a household shoulders disproportionate energy burdens. Improving energy efficiency requirements of the building codes in various jurisdictions, as well as developing mechanisms for ensuring that houses are built to code will serve to improve the quality of housing stock going forward. However, older housing stock will remain in need of energy efficiency upgrades that go beyond the 'energy trinkets' approach often funded by utility companies and evaluated in this work.

As the discussions in Chapters 4 and 5 suggest, fundamentally altering relationships of access to energy services, as is done in Tsay Keh when the Nation provides free electricity for all residents, or in relying on wood which is accessed outside of the market system goes some ways towards alleviating the immediate hardships experienced by households. However, this transfers the higher burden to the community level. On the one hand, community level organizations in First Nations communities (as well as social housing providers) may indeed be in a better position to handle this burden, and address it by implementing deep energy efficiency upgrades (there is also some evidence to suggest energy savings far beyond those achieved in standard utility programming is achieved, at least over short time frames, when deeper retrofits are implemented in programs that are designed in collaboration with communities). On

the other hand, displacing the burden of paying for expensive energy carriers, does not eliminate the processes that create them, when they are situated at the provincial level of energy planning.

Tsay Keh's attempt at developing their own community energy project was certainly one alternative to the provincial approach to electricity planning — where one relies on large centralized facilities, the other sought to produce enough energy to meet the needs of a small community; where one prioritizes non-existent industrial demand, the other prioritizes community needs; and where one is developed with little public input (and by subverting and avoiding public review mechanisms), the development of the other was community driven. Furthermore, the community energy project, sought to explicitly address particular aspects of Tsay Keh's energy poverty: Firstly, It sought to convert something that the community associates with the destruction of their lands into something positive for the community. And more importantly, it sought to undermine the cycles of dependency on BC Hydro in the community, by becoming self-sufficient with regards to making decisions about the community's energy futures. This fundamental altering of relationships of access, both in production and distribution of energy represent one avenue of interest to off-grid communities in addressing energy poverty.

However, as I outlined in Chapter 5, BC Hydro's role as the ultimate arbiter of what counts as legitimate demand and what are appropriate ways of meeting said demand, in Tsay Keh's case, ensured the continued production of the paradigm of energy planning that produces Tsay Keh's energy poverty. BC Hydro's approach to demand projection province wide, still aiming to satisfy non-existent industrial energy needs by developing large hydro-electric facilities, such as Site C, paid for by BC Hydro rate payers, stands in stark contrast with their approach to demand projection in Tsay Keh, where they deemed the community's future demand projections artificially inflated, and as Chapter 5 outlines, ultimately made the community energy project too financially risky for the community. Ironically, Tsay Keh's demand since the energy project was put to bed, has grown fairly close to community energy projects projections and BC Hydro has already had to purchase more diesel generators to meet the community demand.

The parallels between the historical trajectory of electricity development in BC and the current approach to electricity planning in the service of extractive industries are remarkable. As I suggested in the Introduction to this dissertation, electricity planning in BC is currently deeply entangled with the Province's aspirations for attracting the LNG industry to the province. In the service of making this extractive venture possible, BC Hydro is building a third dam on the Peace river and the province

exempted this dam from the requirement of review by the independent Utilities Commission. Much like the original dams on Peace river, there is no demonstrated need for the electricity produced by this dam and despite the numerous incentives offered to the LNG industry, it is unlikely that it will materialize in the short or medium terms given the state of natural gas market world wide. What's more, the cost of building this dam is directly passed on to the BC publics who continue to see increases in their electricity rates. BC Hydro's ten year rate increase plan sees electricity rates increase by 28% over the first 5 years of the plan (starting in 2014), and continue to rise, though by an as yet undisclosed rate for the next five years (But rate payers are assured that it will be "low and predictable" (Province of British Columbia, 2013) and in the 2.5 to 2.6% range (Hoekstra, 2013)). Assuming a 2.5% increase over each of those 5 years, BC Hydro rate payers will see a 45% increase over the course of a decade. Furthermore, it is widely expected that rates will continue to rise beyond 2024, when the full cost of the already over-budget Site C dam is known.

An almost doubling of electricity prices (for many British Columbians, electricity is heating fuel as well, and this group will be more severely affected by these changes) would no doubt have an effect on energy poverty rates in the Province. However, I mention these price increases not only to highlight that expected increase in incidences of energy poverty in British Columbia, but also to point out the obvious fact of the entanglement of energy poverty with energy policy more broadly than the detailed explorations of energy planning practices in this dissertation has demonstrated. In other words, British Columbia's current policy of promoting the LNG industry and its corollary electricity policy, manufactures an energy plenty in the province that simultaneously creates energy poverty for some British Columbian. This entanglement of energy production and the creation of energy poverty, as various parts of this dissertation have demonstrated happen at the broad policy level, as well as in the minutiae of energy planning and forecasting practices that ultimately decide what forms of energy demand are legitimate, and which ones are not.

Furthermore, this process of manufacturing an energy plenty is part of the processes of colonial accumulation of capital that the settler political economy of British Columbia is almost exclusively based on. First Nations communities who by virtue of their economic marginalization are already facing higher energy burdens will experience the effects of these processes, not only as the price of electricity increases, but also as capital encloses their lands, and further dispossesses them of the ability to practice land-based political economies— whether it's by flooding the land to produce electricity to power

other extractive industries or whether these extractivist industries do the primary work of enclosure. Recognizing this double impact is an important step in thinking about what it takes to address energy poverty.

Many First Nations communities in BC, including those in the Peace region fighting the Site C dam, those on the coast, fighting LNG facilities and those that aim to develop their own community energy projects, seek to break these patterns of energy and resource development, to stop the processes that leave them, as well as settler British Columbians, in precarious energy access. As Chapter 5 demonstrated, to understand energy poverty as a product of these patterns of energy development is to propose fundamentally different sets of solutions to the problem of precarious energy access. For Tsay Keh, this solution was envisioned as a community energy project. In other communities, the solutions may indeed be different, but solutions that take this insight seriously will seek to fundamentally alter relationships of access to energy.

7.1 In lieu of policy recommendations

Making policy recommendations is an act that legitimizes existing processes of policy making and governance by affirming their claims to governing the people, places and relationships that they claim to govern. Much of this dissertation has suggested that processes of energy governance in BC, including energy planning processes that prioritize non-existent industrial demand from an aspiring extractive industry over energy affordability for the people served by BC's public utility, energy extractive processes that disregard indigenous dissent, as well as the exemption of energy projects deemed important for this agenda from public review processes, indeed, lack legitimacy.

The government of British Columbia has legislated processes and mechanisms for better energy planning in the form of a Utilities Commission (which came to exist, as a result of public organizing and outrage in the 80's, precisely to stop the kind of reckless dam building that is destroying the Peace again today) and requirements to BC Hydro to develop its Integrated Resource Plans in consultation with the publics (and also industry). But the government has chosen not to use the Utilities Commission, despite being required by its own laws to do so, and mandated BC Hydro to develop particular kinds of projects instead of committing to open deliberative processes of resource planning. The processes employed by the Utilities Commission and BC Hydro can be improved in many ways to include a broader range of publics and concerns; but when strategic energy projects are exempted from public review, when there

is not even a pretence of respecting process, it seems futile to make recommendations for their improvement. Furthermore, if we are to take the demands for decolonization and self-determination seriously, we would have to acknowledge that neither federal nor provincial governments have the moral (and increasingly legal) authority to make decisions about indigenous lands without the explicit involvement and consent of the indigenous nations whose lands they claim to govern. To make policy recommendations under these circumstance would give the current state of affairs a kind of legitimacy that it does not deserve.

In my view, meaningful change comes from the grassroots mobilizing to make their interests recognized, before policy makers are finally forced to change policies or develop new ones. Rather than making policy recommendations that legitimize the current state of affairs, therefore, my recommendations are addressed to people and communities that fight for energy justice in BC and Canada (I recognize some of these people might even be employed in policy making positions), in the form of a list of things to fight for, in no particular order:

- *Energy poverty affects those who are in poverty.* Fight to increase welfare rates, implement moratoriums on winter disconnections from electricity or heat, and create emergency funds available to low income people for crisis management. Also fight for easier and more flexible payment and reconnection options, and winter fuel subsidies.

- *Energy poverty is not the same as having low incomes.* In fact, the majority of those who are in energy poverty, have household incomes that are above the LICO values by more than 30%. Fight to get recognition for lower middle class households who spend disproportionately large parts of their income on securing access to energy services. Energy efficiency programming that aims to alleviate the burden of energy poverty should not exclude this group.

- *Energy efficiency programs that do not engage in deep retrofits do not do much for alleviating energy poverty.* Fight for 'deep' retrofit programs over the 'energy trinkets' approach employed by programs like ECAP.

- *Energy use has a U-shaped relationship with income.* In other words, energy use decreases with income up to a point (accounting for the fact that more energy efficient houses and appliances are more expensive) and then increases with income (as houses get bigger). Fight for progressive

energy/carbon taxes that take the shape of the U into account.

- *Housing quality is a predictor of energy poverty.* Fight for better energy efficiency requirements in the building code and explicitly involve colder Northern communities in this process as their needs are different from the needs of warmer climate zones in BC, where all policy seems to be made. Fight for better code enforcement. And fight for affordable housing (so you can fight for keeping it warm).

- *Communities know their own unique needs best.* Work with communities to develop alternatives to utility-based programming. Community energy programming can include developing community energy plans, community-based energy efficiency and retrofit programs, and community (renewable) energy projects. The risks and barriers to the development of the latter item is higher (but so are the rewards), so proceed cautiously and fight for better processes for the development and integration of community energy projects when they interface with other utility providers.

- *In BC, prioritizing extractive capital in energy planning contributes directly to energy poverty and continues to disposes indigenous communities.* Fight processes that grant access of indigenous lands to extractive capital without the explicit involvement and consent of indigenous nations. Also fight capitalism and its reach in energy governance.

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