PLANETARY PRAXES AND SUSTAINABLE UNIVERSITIES:

LIVING AND LEARNING THE KEELE CAMPUS BIOME

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Abstract

What is sustainability in Higher Education (HE)? How should it be represented? Who gets to decide? This thesis offers a response to a particular technocratic and teleological way of thinking about sustainability in Higher Education, which has a series of high profile advocates in theory and policy. In contrast, my study explores two particular sustainability projects (Energy Management Project and Local Food) at a large Canadian suburban university campus. Using a grounded theory/situational analysis approach, I represent these two projects as dynamically bound praxes (shaped by a series of actors and imaginaries). **Results:** given the historical exigency and contention surrounding sustainability since the mid-90s, a multiplicity of actors in the Keele campus, both semiotic and material, have moved into positions to transform its demarcated boundaries therein. As I have begun to map these movements, I suggest this work be continued by future researchers in a position to do so.

Dedication

For Lil,

The first rose of summer

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Chapter 1: Introduction

"To halt the decline of an ecosystem, it is necessary to think like an ecosystem"

–Douglas P. Wheeler

"They keep saying that sea levels are rising an' all this. It's not to do with the icebergs melting, it's because there's too many fish in it. Get rid of some of the fish and the water will drop. Simple. Basic science."

–Karl Pilkington

Chapter Overview

In this chapter, I introduce the core concepts and theoretical/methodological positions on which this study is based. These concepts swirl around a central thesis which argues that how we think about knowing and doing sustainability at York University's Keele Campus might be framed as a system of multiple praxes, some of which come to "count" as sustainability, through the demarcation of boundaries (Gieryn, 1999; Sismondo, 2010) by certain actors and their sustainability "imaginaries" (Taylor, 2003; Castoriadis, 2007).

York University and Multiple Praxes of Sustainability

In March of 2008, more than 40 students marched on the office of Mamdouh Shoukri, the recently-appointed president and vice-chancellor of York University, following a rally to enact a university-wide sustainable purchasing policy for clothing and other items sold on York's campuses. The students, after requesting an audience with Shoukri to present their petition and demands, were quickly turned away by administrative staff and proceeded to stage a sit-in until their voices were heard (Kaderdina, Summer/Fall 2008).

For nearly 48 hours, the students sat in a cramped hallway outside Shoukri's Keele Campus office awaiting a promise from the president to end sweat-shop purchasing. Several online newspapers and non-profit websites report that the group, as part of the student-led Sustainable Purchasing Coalition (SPC), was calling on the administration to sign, as other

Canadian institutions had done, a pledge to "reform York licensing and purchasing policies to more sustainable standards" ("No Sweat Victory," 2008). In an interview for this project, one of the students additionally recalls petitioning for more administrative representation for decision-making related to sustainability issues at the university (Aaron, Interview, 28 March 2014).

The sit-in ended when Shoukri, agreeing to meet with the students, promised that a policy would be drafted for ethical and sustainable purchasing that would be "as progressive" as those of other institutions. Thus, in the spring of that year the sustainability committee at York, which at the time was composed primarily of student groups and administrative members of the Office of the Vice-President Students, approved a "No-Sweat" policy at York (President's Sustainability Council, 9 October 2008). This measure essentially involved the President signing a third-party declaration with a promise to prohibit the sale of apparel produced in a sweat shop by any York University Licensee. This meant that any vendor using the York University logo on consumer items must be a licensed member of the Fair Labour Association and Worker's Rights Consortium, both of which are third-party NGO's who monitor labour and sales practices (Aaron, Interview, 28 March 2014).

Less than a year earlier, York University's Vice President Finance and Administration updated York's policy on the *Procurement of Goods and Services* (2007) by including a section which compels the University to "incorporate sustainability standards into its procurement practices and give favourable consideration in its evaluation process to those goods and services which reflect this commitment to sustainability or broader social responsibility" (1). Though the ambiguity of such a measure is palpable, would such a policy not have been sufficient in deterring the procurement of wildly problematic goods, thus eliminating the need for more aggressive action? Around this time, other groups such as York's Institute for Research and

Innovation in Sustainability (IRIS) and the Faculty of Environmental Studies (FES) began to encourage and provide resources for student research inquiries into York's purchasing and other practices not deemed sustainable (Gudz, Morris, and Dubreuil, 2009). Contemporaneously, university departments like Student Community and Leadership Development (SCLD) alongside the YorkWise initiative began broadly coordinating the university's student groups and their respective projects addressing such concerns like the group Regenesis@York and their efforts to open a "Free Store" for clothing and other used goods. As this stage of the argument, I would posture that York University is not simply characterized by a single representation of a tacit sustainability versus an amorphous oppositional force (such as a neoliberal agenda, see Islam, 2013) looking to shut it down. Rather, the institution seems to be characterized by multiple representations of sustainability, such as organizations and projects, often speaking and acting very differently from one another (Kurland *et al*, 2010; Kurland, 2011; Posner and Stuart, 2013).

I offer these and further reflections as somebody who has worked at York University in a variety of capacities related to sustainability. Over the course of my short two-year tenure as a graduate student, I have participated in and contributed to sustainability praxes for a few of the institution's many associated departments and organizations. For the President's Sustainability Council (PSC), I have served as one of its student representatives and will remain part of the group as the chair of the student subcommittee into the 2014/2015 regular session. Additionally, I have been involved in the development and management of the university's first regular Farmers' Market through Regenesis@York. Through these experiences, I have found myself in an advantageous position to observe and document the multiple voices in the institution who speak for, and find new ways of doing, sustainability or sustainable activities. As such, I situate

my project within these experiences and trace the narratives of individuals and groups by writing from my own position within them.

Founded in 1959, York University has steadily grown to become the third-largest post-secondary institution in Canada, enrolling more than 55,000 students as well as employing upwards of 7,000 staff and faculty. York has two campuses in the Greater Toronto area, Keele and Glendon, which are located in the suburban North York region at the northern tip of the Toronto city boundary near Steeles and in the Don River basin northeast of downtown Toronto respectively. The formalized governance structure of York, like most Canadian universities, has the president at the "top" of the hierarchy, with a senate and board of governors who approve policy "above" the president, and several vice presidents underneath who "govern" the realms of finance, research, academics affairs, and others. For this study, my focus will be on the Keele Campus and the collection of social and political elements which reside, cooperate, and compete there; I will develop this focus further as the paper progresses.

In combination with such a multitude of internal forces, other pressures regarding how higher education institutions *ought* to act amidst growing ecological crises (Biro, 2005) dictate the shape and trajectories of York's multiple sustainability praxes. Indeed, the ways in which the universities appropriate and act on not just ecological, but social and economic, sustainability become an indication of, and basis for, their ideological positions within broader social and political spheres. As teaching and research tend to take precedence as the goals of these institutions, scholars and educators often utilize these missions as the bases on which to launch efforts within the university to increase support for and engagement with sustainability projects. Orr (2002) recognizes the material importance of universities to external communities, insisting that knowledge for sustainability from universities should be shared with practitioners on the

ground and faculty should "broaden their research and scholarship to include its social, ethical, and legal context" (41). In my experiences within a seemingly cosmopolitan university, multiple systems and representations speak with multiple voices to both external and internal publics and interest groups who often expect from the institution a single voice on how sustainability, among other concerns, should be "done" according to innovative methods in research, pedagogy, and praxis (Trencher et al, 2014; Stephens et al, 2008; Corcoran et al, 2002).

For the purposes of this research, the concept of praxis, as opposed to practice which is definitively repetitive and concerned with social reproduction (Bourdieu, 1990), means both creative and transformative action. Such a definition of praxis borrows from several traditions including the Aristotelian (Gadamer, 1975; MacIntyre, 1999; Dunne, 1993), Marxian (Kemmis and Smith, 2008; Adlong, 2008), and post-Marxian (Ax and Ponte, 2008; Lander 2008; Mattsson, 2008), all of which have been used by a number of scholars and pedagogues working in higher education fields. Kemmis and Smith articulate a useful definition of praxis which combines the former two traditions and can be effectively applied to my research:

> "It is action that is *morally-committed, and oriented and informed by traditions in a field.* It is the kind of action people are engaged in when they think about what their action will mean *in the world*. Praxis is what people do when they take into account all the circumstances and exigencies that confront them at a particular moment and then, taking the broadest view they can of what is *best* to do, they *act*" (4, italics from original source).

Applying these terms to sustainability, praxis is contingent action to resolve historically exigent problems, such as exploitative third-world labour practices or excessive eutrophication of waterways through textile manufacturing, within an individual or group understanding of said problems; praxis, in this way, is often linked to the affordances and constraints of group membership (Smith, Edwards-Groves, and Kemmis, 2008). The post-Marxian interpretation is also applicable to this study in the sense that praxis for sustainability also "opens the way for

critique and a critical view of praxis offering opportunities for critical consciousness that can explore… moral and political actions" (5). In this way, praxis operates as both action from a particular perspective and precursor to transformation of given socio-political situations. This is why, for this research, praxis is a central component to understanding how institutions like York know and "get done" multiple sustainabilities.

To further exemplify the phenomenon of multiple sustainability praxes, we can look no further than the participants and actors at the Keele Campus who frequently mention the substantial reductions in carbon emissions brought on by the development of "alternative transportation" infrastructure (York University Office of the President (YUOP), 2010a; YUOP, 2010b; YUOP, 2012; YUOP, 2013). Within this movement, one of the more contentious and decentralized conversations has been around cycling and what it means for the many different sustainability praxes operating at York, each rooted in different ontological and epistemological assumptions as to the role and functioning of their own group within the university, as well as that of the university itself to society at large.

Indeed, over the last decade, the York University Development Corporation (YUDC) has set aside land for bicycle infrastructure such as racks, storage facilities, and showers (YUDC, August 2013). This infrastructure is maintained on an ongoing basis by Campus Services and Business Operations (CSBO). YUDC and CSBO have made efforts to extend these services through space agreements with groups like Smart Commute to enhance cycling awareness and availability at the Keele Campus, and even conversing with BIXI to bring bike rental stalls to the community. Contemporaneously, student groups such as Regenesis@York and The Bicycle Project, receiving resources from the administration, envision Do-It-Yourself bike workshops for the York community. In one of the interviews conducted for this study, all of which will be

discussed in greater detail in the next chapter, Regenesis co-president David describes the concepts as "a bike share program not with something that's nice to use, but… a utilitarian vehicle (sic)" (David, Interview, 8 February 2014).

It seems almost self-evident, unavoidable, or even necessary, for a complex institution like York to operate through multiple representations and associated praxes working independently for the benefit of the entire system; yet when the work involves "sustainability", in all of its socially and environmentally ascribed meanings, the processes of knowing and doing create a great deal more political tension and complexity. Questions of what it is and how to "do" sustainability continually circulate the institution and cause new "answers" to emerge from different places. Indeed, the push for the No-Sweat legislation by the SPC in 2008 alongside the projects of student groups and research institutes concerned with sustainability not only created new education and policy trajectories for the university, but also helped to establish a centrally-administered committee for developing, through its corresponding administrative departments, sustainability projects at York's Keele and Glendon Campuses. President Shoukri and other high-level administrators established this group, known formally as the "President's Sustainability Council" (PSC), following the student protest as a means to "feature York as a university committed to sustainability by improving visibility and presentation," according to Shoukri (PSC, 9 October 2008).

This is not to say that York simply began systematically "greenwashing", but rather that it began recognizing and promoting through official channels a number of existing policies and education programs. Simultaneously, the PSC began mobilizing administrative departments and student groups in all corners of the university under the banner of York's expanding institutional mission of sustainability. It is also important to recognize that the work of the PSC did not

manifest from "nowhere". In 2002, the Office of the President initiated a "task force on sustainability" which began to uncover the praxes undertaken by groups such as the York Centred for Applied Sustainability (YCAS) and other groups (Planning, Budget, and Accountability, 2003). However, the most important development of the PSC to trace for the purposes of this study is the widespread *representation* of sustainability through the work done by multiple groups at York for the benefit of internal and external actors. These representations found in food, energy, and other projects and materials lent themselves to the expansion of sustainability imaginaries (Castoriadis, 2007) and, subsequently, new relations among the university's actors.

The President's Sustainability Council, according to President Shoukri and other supporters, would not be bound by the administrative barriers which separate the units of finance, research, academic, and students. Rather, the council would function through a number of "categories" of sustainable development contingent upon relevant administrative departments with the appropriate knowledge, labour force, and access to resources. The idea, it would seem, was to create a way for the university to speak with a singular voice on sustainability to its multiple external stakeholders and dependents. I argue in this paper, however, that the PSC representation initiative has been both a systematic demarcation of boundaries to demonstrate what "counts" as sustainability (Anderson, 1990) at York as well as an opportunity for my own "boundary work" (Alsop & Bencze, 2012; Gieryn, 1999).

Nine departments which represent and "do" institutional sustainability have emerged from this transformation through which the PSC has positioned itself to direct and mobilize knowledge drawn from various techno-scientific as well as institutional brokers. These nine categories are food, energy, infrastructure, land, curriculum, waste, transportation,

administration, and water. The praxes undertaken by actors within these categorical departments, as we will see, tend to operate within demarcated boundaries and, as such, can be said to "count" as sustainability at York. To put it another way might be to call the sustainability praxes operating within said boundaries, drawing from Kuhn (2012), "normal" sustainability.

Grasping the plurality of sustainability praxes at York, both inside and outside the boundaries of the "normal", entails an understanding of both social and ecological actors interacting within a contiguous zone; the interactions between these actors-both human and nonhuman- require ongoing nourishment and maintenance undertaken in such a way as to prolong the life of the zone as well as those zones to which it is directly and indirectly connected. Before grounding this study in such a contiguous zone, however, it is necessary to state my central thesis and define my own theoretical and methodological boundaries.

Framing the Study

At its heart, this study stems from questions of policy and praxis that are central to my own research and praxis, as well as the work of multiple environmental educators living in globalized and urbanized 21st century environments. It has become pertinent for us to understand: what does social and ecological sustainability look like in higher education institutions and how are its individual and group members coming to "know" and "do" sustainability at the level of the university campus? Walter Filho (2009) argues that "sustainability must be infused" into higher education institutions, as dictated by influential documents such as UNESCO's (2006) "United Nations Decade of Education for Sustainable Development" (1). This and other similar documents have emerged to help put limits on human social enterprises' destruction of ecological and geological systems; these systems, in turn, have

complex limits beyond which their services for life on this planet, many scientists argue (Gerten et al, 2013; Galaz et al, 2012; de Vries et al, 2013), do not function effectively.

I would argue that scholars and university sustainability practitioners thinking about institutional sustainability as simply a single representation of that of other institutions with similar goals, based on their prescriptive documents, feeds into the conception that sustainability is a single transferable framework and tacit set of knowledges, policies, and practices for institutional use (Jacobson, 2010; Shriberg, 2002; Corcoran et al, 2002; for a list of aforementioned prescriptive documents see Wright, 2002). Such conceptions restrict an understanding or interrogation of multiple sustainabilities constructed from multiple formations and representations of knowledges and praxes operating in a contiguous zone. I may even go as far as arguing that scholars and other participants in higher education campuses are complicit in deliberately excluding a multiplicity of representations (Latour, 2012) when thinking and writing about sustainability in order to successfully transfer their politics and praxes between narrowly-defined human institutions, such as universities.

When considering how sustainability gets done, one must not only consider the multiplicity of representations and praxes of *human* actors, but also the politics of the nonhuman (Latour, 2005) trees, soils, waterways, climates, machines, metals, carbon atoms and others acting within these projects at the local level (Whitworth, 2000). With these concepts in mind, I would argue that the multiple sustainabilities of York's Keele Campus, as well as others like it, should be understood and explored in terms of their proximal social and ecological environments, the human and nonhuman actors who inhabit their sustainability networks, as well as the imaginaries of sustainability from which they develop their praxes.

I model the concept of "imaginaries" after Taylor's (2003) definition which explores how "ordinary people" abide by a "common understanding that makes possible common practices and a widely shared sense of legitimacy" in relation to actor-bound sustainability praxes (23). In my use of the term, I also consider Castoriadis' (2007) definition as it applies more specifically to sustainability and ecological crises in that imaginaries elicit a creative dimension in human activity, which connects the material and semiotic, sensed and perceived by humans at the local level, to broader ideas of metaphysical meaning. In other words, material representations found in a locally grown carrot, dirty and mangled, might be creatively connected to a basket, an open space, a student group, and a student acoustic band in order to represent, as a farmers' market, local food sustainability (see also Tovar-Restrepo, 2012). Though I do not necessarily fully agree with Castoriadis' (2007) individual perspective, his views are highly influential in multiple fields and very critical of the scientific imaginaries on which western, capitalist societies construct solutions to socio-ecological problems.

Research Questions and Thesis

This leads me to my main research questions: who exactly are the *actors*, to use the Latourian (2005) term, involved in making sustainability look and feel a certain way at the Keele Campus? What exactly *are* the particular sustainability praxes "getting done" here and, most importantly, what are the boundaries of sustainability praxis which, through scholarly interrogation and boundary-work, reveal what *can* be done according to the specific actors operating therein? One of the purposes of this research paper is to begin to develop an understanding of the demarcation of these boundaries by exploring how certain kinds of knowledges, techno-scientific and otherwise, of sustainability are learned, organized, and mobilized within a small-scale, highly-politicized system of human and non-human stakeholders.

At this point, my central thesis is that the desire to transfer and "infuse" sustainability, supported by a number of high-profile scholars and university practitioners, into this place of higher education forces researchers to sidestep a number of important questions concerning *whose* sustainability. It is vital to continue to tell the story of York's sustainability from the voices of the multiple actors who imagine and act on its multiple representations and subsequently demarcate and modify its boundaries of praxis at certain historical moments. I find that telling the story according to a seemingly singular voice which speaks of the cumulative, teleological progress of a unified campus doing sustainability sidesteps a number of important questions. In a number of ways, this work continues work done by York's Institute for Research and Innovation (IRIS) in how they consider these narratives from multiple disciplinary perspectives (see Bazely, Royle, and Tagliavia, 2009; Morris et al, 2009; Gudz et al, 2009; Esseltine et al, 2009/2010). Nevertheless, a teleological way of thinking about sustainability should be considered as *one* of the multiple "imaginaries" on which the actors at Keele base their praxes of sustainability and demarcation of boundaries around what counts as "normal" sustainability. In other words, a represented "tradition" of sustainability (see YUOP, 2013) feeds into what counts as sustainability praxis at a given historical moment.

Conceptualizing the Scope of the Research

With this in mind, we must begin to understand the campus as "an academic, social, or spiritual entity" (Merriam-Webster, 2014) which embraces the idiosyncratic and microcosmic interactions of both human and nonhuman forces therein. A good place from which to develop such a definition would be the newly emerging theories of anthropogenic biomes (Ellis et al, 2010; Ellis & Ramankutty, 2008) through which scientists have begun to classify regions in terms of their historically-produced socio-ecological relationships rather than simply their

climatic or biological properties. This classification system includes biomes such as urban settlements, residential irrigated cropland, and populated forests.

Such models are useful as they not only poignantly illustrate the development of socio-ecological systems through regionally-specific relationships of production and consumption, but they also properly attribute historical agency and contingency to both natural and cultural forces. Alessa and Chapin (2008), in explicating the importance of further scholarly engagement with anthropogenic biomes, argue:

> "The activity of humans and other organisms is often concentrated in hot spots of high biological activity and cultural value. The values, understanding and perception of these hot spots by human (and non-human) communities result in specific patterns of resource use that, in turn, feed back into the overall system at local scales" (530).

In other words, there is an identifiably epistemological component in the discourse of anthropogenic biomes in which knowledges and representations of a system affect the development of any related sustainability praxis. Thus, to understand a particular biome is to understand how it is represented, learned, and subsequently acted upon by its participants rather than simply how it "functions". Yet one aspect that remains unexplored through the anthropogenic biome model, particularly when trying to understand and theorize the socio-ecological praxis of its participants, is that the changes made through learning and action do not feedback equally across and into the whole of the biome. In other words, certain praxes undertaken within the biome are not conducive to a simple or singular categorization and, as a result, manifest multiple forms of sustainability.

In the case of institutions such as the York University Keele Campus, conflicts and incompatibilities between multiple sustainability praxes can be attributed, in some small part, to their linearity and subsequent interaction with inherently non-linear, or cyclical, biotic processes. For example, one particularly complicated practice, which has garnered significant attention in

recent years, is that of local food production and consumption. York's Campus Services and Business Operations, through its Food Services department, emphasizes its support of locally-sourced food economies through its contracts with Aramark Canada and one of their Ontario-based suppliers, Bamford Produce. Indeed, the department cites one of their most successful projects for sustainability as "using 25-30% local produce" (Timothy, Interview 17 Mar 2014). Thus within this sustainability model, food locality takes primacy, while incompatible socio-ecological relationships involving soil and water, for instance, remain absent from this particular sustainability praxis at work.

For one such example, ecologists have argued that increases in the demand for locally-grown food perpetuate further loading of synthesized nitrogen and phosphorous from industrial fertilizers into the earth in order to force soils to accommodate incompatible crops at times when their nutrient-delivery capacities are incongruent with the crop demands (Vogt et al, 2010). Gradually, nutrient-rich nitrogen and phosphorus flow into nearby water sources, causing eutrophication of waterways through blooms of nutrient depleting phytoplankton and bacterial toxins.

Due to the desire for success in infusing sustainability, the institution rarely accounts for these processes directly when thinking about sustainability. Nevertheless, these nonhuman actors represent *themselves* in other ways when encountering other human "imaginaries" (Taylor, 2003) of health and sustainability. These relations manifest new sustainability knowledges and praxes, potentially transforming the boundaries, at the level of the individual biome to stabilize its health. For instance, human praxes to obtain increased water from single-use bottles from faraway sources may begin to nourish individuals in the biome, re-establish new praxes which seek to maintain its socio-ecological well-being, and even change how the scientific community

might represent the biome (Ellis et al, 2010). This latter point may be an overstatement, but it does stand to reason that how praxis is understood in an anthropogenic biome, like an irrigated cropland or university campus, is a central component in its definition and means of sustaining it. In other words, a biome's classification has little to do with its "natural" characteristics and more to do with the representation and praxes undertaken therein. Moreover, a redefinition of boundaries, such as the appropriation of corporatized water bottles, may even undermine other active sustainabilities such as York's upcoming ban of bottled water sales.

Thus, the anthropogenic biome model of inquiry which presupposes static, or monolithic qualities in a region is limited in significant ways as it seems to impose the view that the socio-ecological relationships and praxes therein are inherently linear. Resources of an ecological system do not feed into, nor are they understood and manipulated, the same way across dependent human communities; likewise, human communities within a given biome do not "impact" related or nearby ecological systems in an equal or linear fashion. As ecologist and educator Fritjof Capra (2007) argues, "Successful living systems… are highly nonlinear…. When something is good, more of the same will not necessarily be better, because things go in cycles, not along straight lines" (11). As a result of such cyclical interactions, new sustainability praxes emerge from unpredictable locations and scholarly efforts should be undertaken to trace the plurality of praxes which emerge from new relationships and imaginaries within these cycles. This is one reason, among others, why sustainability in biomes such as Keele cannot be understood as transforming according to a cumulative or progressive teleology (Faber, Manstetten, and Proops, 2000; Udo and Pawlowski, 2009; for a seminal critique of teleology in ecology see Foster, 2000).

This is not to say that the anthropogenic biome model ignores inevitable paradigm shifts in the socio-ecological changes of individual biomes. Rather, it historicizes such changes over long periods of time without accounting for the rapid shifts, in terms of both destructive and ameliorative praxes, taking place in our current generation. Such shifts have led ecologists and geologists to dub this historical period the "Anthropocene" in which humans are the most effective "geologic" force of change on the planet (Crutzen & Stoermer, 2000; Steffan, Crutzen & McNeill, 2007). Though the concept of the Anthropocene is hotly contested among scholars (see Steffen et al, 2011), it is useful for my interest in how representations of rapid human destruction manifest praxes in new and unexpected ways. For the intents and purposes of this paper, I will continue to refer to the Keele Campus as a distinct biome under the assumption that this nomenclature captures *both* the anthropogenic (human) and non-anthropogenic (nonhuman) forces essential to the demarcation and maintenance of its boundaries.

Theorizing Sustainability and Boundary-Work

Framing this study within an individual biome leads me to the question: considering the inherent incongruency between linear sustainability praxes with cyclical socio-ecological relationships, constantly manifesting new knowledges and praxes at Keele, how can this study be applied to broader projects for the sake of organized socio-ecological amelioration? Perhaps the answer lay with the concept of the "Anthropocene" and its relationship to human boundary demarcation in sustainability. Firstly, it seems pertinent to discuss briefly the genesis of the term "Anthropocene" as well as its contemporary application in the field with respect to this study. Following over one hundred years of international scientific discourse pertaining to the role of humankind in shifting natural processes, Eugene Stoermer working with P.J. Crutzen (2000)- who in the 1970's and 80's, alongside colleague Mario Molina, discovered the Antarctic Ozone

Hole- coined the term "Anthropocene" in order to underscore the growing ecological transformations caused by human industrial processes and over-production of fossil fuels.

Since then, international scholars from chemists (Steffen et al, 2007) to geographers (Ellis, Antill, & Kreft, 2012) to climate policy analysts (Biermann et al, 2012) have taken up and expanded the concept to include a number of ecological systems whose rapid changes and deteriorations implicate increases in anthropogenic activity, particularly since the 1950's. Much of this work has been undertaken by the Stockholm Resiliency Centre, culminating in the scientific definition and designation of nine planetary boundaries which go beyond Stoermer and Crutzen's (2000) discussion of atmospheric and stratospheric carbon and their associated feedbacks into human systems. In their highly-accessible work, *The Human Quest,* ecologists Johan Rockström and Mattias Klum (2013) have theorized these boundaries as the thresholds for nine types of socio-ecological relationships of resource production and consumption which cannot be crossed without risking the stability of Earth's key ecological and geological systems. These scientifically quantified boundaries- stratospheric ozone depletion, climate change, ocean acidification, land use change, freshwater consumption, nitrogen/phosphorus cycle shifts, biodiversity loss, chemical pollution, and aerosol loading- intersect with culturally defined boundaries in local settings where participants who are invested in the maintenance of a given biome learn and act to promote socio-ecological sustainability. This framework has become such a powerful actor in representing sustainability, it has been endorsed by the United Nations Secretary General Ban-Ki Moon and was introduced at the Rio Summit in 2012 (Sharma, 2012).

I conceptualize the process by which this set of scientific knowledges is represented, imagined, and "gets done" by and between various institutional actors and comes to "count" as sustainability praxis at York University's Keele Campus. As Kütting and Lipschutz (2009)

argue, "top-down" scientific knowledges and approaches "are unlikely to work as envisioned in the labs, think tanks, and conferences" (5), and as such, members of "epistemic communities" (Haas, 1992) within Keele demarcate boundaries as they apply to local socio-ecological relationships, and their ongoing maintenance through praxes, at a given historical moment. I argue that this is achieved and understood through the various sustainability projects constructed by key power-holders within the administration. By linking the story of Keele's multiple sustainabilities to the concept of the Anthropocene through the planetary boundaries framework, I demonstrate, for the sake of future activist praxes at the institution, that there does not exist a tacit, teleologically-produced, authoritative sustainability here, but only boundaries demarcated by actor-driven praxes. Other praxes to ameliorate emergent concerns manifesting out of human and nonhuman relations are often not incorporated into these boundaries even though they represent socio-ecological concerns.

Transformation of Sustainability Boundaries

Though I am using the planetary boundaries to frame my own imaginary of sustainability, no boundary takes shape or operates in a vacuum, and thus must be understood in terms of its historical contingency or exigency. As such, with my analytical methods, which I will discuss momentarily, I will try to capture what a number of political ecologists have referred to as the *moment* as I explore my encounters with transformations of what counts as sustainability in historical context. One such political ecologist, David Harvey (2008), when pondering a "certain footnote in Karl Marx's *Capital*", identifies six so-called moments of human evolution and societal change such as social relations, technology, and ideas which are inherently dialectical in their construction. The central portion of this footnote reads: "Technology reveals the active relation of man to nature, the direct process of production of his life… the process of the

production of the social relations of his life, and of the mental conceptions that flow from those relations" (Quoted from Loftus, 2012, xix). In addition to the demarcation of sustainability boundaries, I also explore transformations of what counts as sustainability as it occurs in historical moments by actors, and their imaginaries, who seek to create socio-ecological well-being.

Though I consider the concept of boundaries an important part of thinking about how we know and do sustainability praxis, I am not advocating for my own knowledge of *planetary* boundaries, or any such sustainability imaginary, to be simply transplanted into an institutional system and "implemented" through various administrative and curricular appendages. Rather, I am merely interested in creating a descriptive account of the techno-scientific knowledges or material/semiotic representations I have encountered at Keele which flow into, or manifest within, the biome through various channels and subsequently generate a transformation in sustainability praxes and boundaries. Thus I wish to expand on my encounters with sustainability praxes which have historically counted at the Keele Campus by looking at how they can be linked (or not) to techno-scientific representations of planetary boundaries; these boundaries, however, are not simply "naturally-occurring" and scientifically-axiomatic limits on resource production but, as we shall see, also historically demarcated boundaries of politically and socially allowable praxis within a given biome or ecosystem at a particular historical moment (Roth and Lee, 2002; Rumpala, 2009).

My starting location from which I explore moments of sustainability transformation and boundary demarcation in this paper will be two sustainability projects, which I have encountered in various capacities as a graduate student. These projects concern energy and local food consumption whose goals are to "know" sustainability in these terms and "get it done" while

learning, interacting with, and demarcating the biome's boundaries of praxis and, by extension, safeguarding its well-being.

Introduction to the Methodology

The specific methodology undertaken for this project is, as Clarke (2003) articulates it, of postmodern nature in the sense that it accounts for "situatedness, variations, complicatedness, differences of all kinds, and positionality/relationality… in all their complexities, multiplicities, instabilities, and contradictions" (556). Drawing on Clarke, I wish to undertake a grounded theory approach which utilizes situational analyses and maps in order to "enter" the research and construct a broader picture of the historical moment surrounding each project. The first step of doing so is creating situational maps which "lay out the major human, nonhuman, discursive, and other elements in the research situation" (559). In the context of sustainability projects, this may involve mapping the flows of biotic forces which nourish the biome, discursive understandings of these forces, and the administrative bodies which seek to govern and regulate them.

The second map, the social arena map, "lays out all the collective actors and the arena(s) of commitment within which they engage in ongoing negotiations" (559). In this context, this map may involve sustainability knowledge accessed by certain individuals in certain administrative positions which allows them to form alliances to bring about crucial shifts in the biome.

The third and final methodological map constructed and developed with each subsequent chapter is the positional map which "lays out the major positions taken, and *not* taken, in the data. For my purposes, this level of analysis will help to understand why a particular project, and by extension the sustainability moment, looks a certain way. Through the development of my analysis and movement through time in each section of this study, I will gradually expand the

maps to account for the increasing complexity and nuance associated with institutional sustainability.

Such a methodology allows me to engage in multisite research drawing data from both ethnographic transcript notes, contemporary visual and textual evidence, as well as archival sources from past projects. I am utilizing transcriptions from seven interviews of administrative staff as well as students and faculty members who have acted as key players in the development of certain sustainability projects. It is important to note that this is a semantic analysis which looks to interrogate the "codes" used by individuals in certain contexts. These codes act as markers or "road signs" to help guide the development of my situational maps so that I may follow representations of sustainability into potentially unforeseen areas of the biome.

Theoretical Frameworks

The main theoretical frameworks used here are, generally speaking, threefold. Firstly, I wish to utilize a particular perspective from the field of Sustainability in Higher Education using Filho's (2009) study as my anchor article. This perspective tends to represent sustainability as tacit knowledge progressing teleologically without accounting for the dimension of *whose* sustainability. Secondly, I develop my study to incorporate the concept of sustainability as praxis operating (or not operating) within a set of boundaries which reveal what "can" be known and done in terms of sustainability. The idea of sustainability as operating within boundaries is based loosely on the work of Rockström and Klum (2013). Concepts of boundaries and boundary demarcation help to frame sustainability in a novel and useful way so long as I demonstrate, as mentioned earlier, that boundaries are not "naturally occurring" but are the outcomes of relationships between actors and their imaginaries in an individual biome. Moreover, the

revelation of these boundaries is based on my own experience as a researcher and member of the community as I encounter them through my own work in various capacities at Keele.

Thirdly, and most importantly, I use concepts from the field of Science and Technology Studies to essentially ground these boundaries in a construction which takes place at the level of an individual biome, namely York's Keele Campus. Primarily, I layer the concepts of Taylor's (2003) and Castoriadis' (2007) "imaginaries", Latour's (2005) actor-network theory (ANT), and Papadopoulos et al's (2008) theory of "imperceptible politics" to begin to understand how the biome decides on what "counts" as sustainability through its ongoing relationships.

Because actor-network theory is the most conceptually contested of these theories, it is useful to show how it will be used in this study. Generally speaking, Latour (2005) proposes a new social theory which "reassembles" all actors, human and non-human alike, as part of a coherent network which may be "followed" (23) by the researcher who, in turn, allows the actors to define and order their own trajectories of social transformation. As I have done and will continue to do in my own study, Latour (2005) deploys the "most general, the most banal, even the most vulgar repertoire" (29-30) in order to allow the actors to speak the loudest while providing the researcher the freedom to move between frames of reference. For my study, many of my interviewees within their respective positions in the biome serve as actors themselves but also conduits through which I can begin to map out other influential actors and networks which populate the networks in charge of the sustainability projects in focus. The maps are far from exhaustive but, like Latour, I do not profess to possess any conclusive data but, like any sustainability project at Keele, accept and encourage further additions, subtractions, and transformations to my data.

A second aspect of ANT which can be applied to this study involves the active boundary formation surrounding the participants in a given network who are acting on a specific imaginary, or construct of what the future ought to look like in terms of sustainability. Latour maintains that every group formation is accompanied by a boundary, or "a wide range of features mobilized to make the group… a finite and sure thing" (33), which occupies the perimeter of the formation. It is through this characteristic of actor-network theory, ongoing boundary making and maintenance, that I deploy the concept of praxis. The boundaries established by a particular network of actors reveal what sorts of praxes relating to change in sustainability are permitted within the network's established spatial and conceptual terrain.

The third aspect of actor-network theory concerns the role of non-humans as actors in a network. The idea behind non-human inclusion in actor-network projects is not to prioritize of actors who have more "significant" or "legitimate" impacts in a network or on a project but to understand the forces and agencies making *any* actor act, or not act, a certain way as part of a whole. Thus as Latour insists to any actor-network theorist, I am obligated to uncover the "traces" (8) or narratives of various actors which compel a certain individual involved in a project to think and act upon it a certain way. Some actors include: an ex-navy CSBO administrator who operates the campus like a sustainable warship, a steam-driven chiller collecting $800,000 in government grant money, an old and overloaded electrical grid which upholds an antiquated provincial regulation, a LEEDS-certified building which compels the change of infrastructure across a campus, and a sustainability council who writes policy to be approved by a governing body. These actors assemble in a network based on a common imaginary to "mediate" a particular "controversy", to use Latour's idioms (52) Through this greater understanding of the emergence of different actors into and out of various networks, I

make visible the invisible, or make perceptible the imperceptible, forces producing and reproducing sustainability at Keele. I also must make it clear that these theories are not intended to "drive" the research forward, as the narratives themselves will do that, but are meant to provide readers and future researchers places to look for further analysis as well as demonstrate the places that I have (or have not) looked myself.

Thesis Overview

My thesis consists of five chapters. The next chapter lays out my methods and parameters for this project in relation to research ethics. The third chapter explores my encounters with praxis related to energy production whose associated techno-scientific imaginaries and major actors co-produce local boundaries of praxis at Keele. In the fourth chapter, I address sustainability praxes of food production, distribution, and consumption, as well as how these are known and done at the local level through a local-food procurement project and the establishment of a farmers' market at Keele. Finally, in the last chapter, I offer some concluding points as to how this research can contribute to a broader discussion of sustainability in urban and higher education institutions.

I periodically refer back to an anchor article, Filho's (2009) work "Towards the Promotion of Education for Sustainability", which keeps my project grounded in a particular perspective within the field of sustainability for higher education and positions my work as a possible critique or alternate way of thinking about learning and living sustainability in higher education settings.

Chapter 2: Methods and Ethical Considerations

Chapter Overview

This chapter briefly outlines the ethical guidelines of this project as well as the methods

undertaken for data collection.

Project Ethics

In terms of both data collection and analysis, this study is part of a larger project entitled

Policy Enactments and Sustainability Education developed by Steve Alsop of York University

and David Greenwood of Lakehead University. The York branch of the project gained approval

by the university's Human Participants Review Committee on 13 September 2013 and began

conducting interviews shortly thereafter. All interview participants, who are all influential actors

in sustainability projects at Keele, signed tailored consent forms and were made aware that their

participation was completely voluntary, there were no foreseeable risks involved, and their

identities would remain anonymous through the use of pseudonyms. However, they were also

made aware that they could, through their testimonies, potentially incriminate themselves as well

as others working in their close proximity, particularly when in elevated political positions. As

such, all participants were provided a copy of the interview transcript and given the opportunity

to rescind any part of their testimony they deemed inappropriate.

Research Methods

To reduce my methods to a basic concept, I would draw from Charmaz (2001) in calling

my work a constructivist approach to grounded theory in that I see "data and analysis as created

from the shared experiences of researcher and participants" (677). With my study, I would take

this concept a step further in saying that the investigation and data collection are not only part of an academic *study* in sustainability, but a *project* intended to benefit sustainability at Keele, not unlike Keele's energy project or the local food project which gather appropriate actors into a network for social transformation.

For example, in all the interviews, open-ended questions were asked which "explore the… topic and fit the participant's experience" (679). Questions were framed to explore the social relations with other human and nonhuman actors which exist "behind" the individual, keeping in mind the Latourian (2005) notion that all actors must be "made to talk" (79) and implicate such forces in their speech. The same is true for the documents collected and analyzed. Thus, the actors involved in this project expose the data for me by referring to other networks and actors which comprise the field of sustainability at a given historical moment at Keele. These data can be added to and modified by other researchers in the PEASE project, as well as similarly positioned groups and individuals, in order to help develop knowledge and, by extension, practice which creates real change in the institution and in the biome. This is also true for the energy and food sustainability projects which seek to transform knowledge and practice at Keele as the projects do not remain stagnant but are modified and updated by their respective actors.

Also like in any of the other sustainability projects at Keele, I encounter and interact with, through my own experiences in this project, boundaries of praxis which reveal to the community what can and cannot be said and/or done at a given moment in terms of sustainability praxis. For instance, upon arrival at my interview with a senior administrator, I was confronted about an email I had written several months earlier to one of his colleagues expressing my disdain, rather sarcastically, for the services I had received as a client. Though the warning had

little to do with the subject matter of my project, it appears to have served as a haphazard warning not only about who is "allowed" to speak for a network but also what counts as speech within it. Thus, one of the few ways in which I would argue my project stands in contrast to those "under study" would be the way in which it, by its very means, works to make visible the networks which remain invisible by the boundaries of praxis which limit or prevent certain actors from acting for social transformation. Additionally, I would argue that my project is activism in the way it explores and interrogates the silent actors and the imperceptible politics in order to open up space for other groups to engage in intellectual debate.

For these reasons, I used open-ended questions in interviews such as "who are the main players in sustainability at Keele?", "what are the university's main successes in sustainability?", and "where do ideas on sustainability come from?" This helps to reveal the codes for a broad situational map which includes individuals and groups involved in making decisions as well as the discursive and imagined elements which drive their actions (see Appendix A for a full list of interview questions). These sorts of broadly defined questions are attempts to avoid what Fontana (2002) identifies as the assumption that there exists *a priori* facts about the social world, garnered outside of experience, which are then imposed on the analysis (163). However, it is important to keep in mind that these questions are not entirely open-ended per se as they are loaded with assumptions about how the university operates hierarchically as well as the shared, intersubjective assumptions that both interviewer and interviewee experience and understand these systems in comparable ways.

As Corbin and Strauss (1990) maintain, data collection should take place simultaneously as analysis in order for the research methods to be productively exploratory. Thus, when interviewing my participants, which have been chosen because of their proximity to or extensive

historical knowledge of the sustainability projects under study, I make note of and often explore further certain conspicuous terms which appear many times or are strangely absent at other times (see Appendix B for a full list of interview subjects). These are the codes which become pivotal during analysis and mapping (see Clarke, 2003) as they act as the conceptual boundaries surrounding the terrain in which the participants create meaning (see Frank, 2010). In terms of the Keele biome, the codes found within the different narratives of various sustainability projects, as told by my participants as well as my own experiences, reveal boundaries of sustainability praxes (at a given historical moment).

In other words, these boundaries reveal, as a result of my research interrogation, what can and cannot be said and done, according to Keele's major actors, regarding sustainability praxis at any given moment. Anything that is said or done within these boundaries reaffirms the imaginaries on which sustainability is understood and undertaken, while anything said or done outside of the boundaries challenges these demarcations or even threatens to transform the boundaries to incorporate new outside imaginaries. For instance regarding food sustainability, concepts such as fair-trade coffee, cage-free eggs, and local produce are mentioned frequently in interviews and documentation while something like student-run co-ops, which have been proposed to York students and administration by various campus groups, exist outside of these interviews. These external aspects of the sustainability narratives offer insight into boundaries of praxis that are important to this study.

Methodology for Research and Analysis

In an effort to "flatten" the Keele terrain in order to open up the collection of data and, as Latour (2005) suggests, make links between actors "clearly visible" (16), as previously mentioned, I utilize a grounded theory approach based on Adele Clark (2003). With this

methodology, my intent is to track and collect codes which the actors in this project reveal in the data; thus, the terrain is mapped by the actors/participants themselves and, as such, their relations with one another help us to see how relationships (or networks) are formed, who establishes and maintains them, and where they reside in relation to the rest of the biome. It may even be useful to consider the research participants as "co-researchers" (Fien, 2002). I make use of Clarke's layouts and categorizations of codes, rather than the codes themselves, for the sake of communication with other researchers as well as comparison with other domains of study. These categories include the situational, social arena, and positional maps; this organization helps to ensure that researchers investigate all pertinent sites for analysis, both human and non-human, at all levels of social interaction while giving the researchers freedom to move between frames of reference without fixating on a single arbitrary vantage point.

Additionally, Clarke's work is well-grounded in methods, emphasizing the importance of ongoing memos and field notes as integral in ensuring every crevice of the terrain is opened up for exploration, particularly the uncertainties as well as the obduracies (561). These field notes, at this stage in the methodology, serve as my open-ended maps to help organize the individual actors and draw out connections based on the codes in the data. I deploy these maps in my case studies as metaphors for the positions and movements of actors in the various sustainability project networks. With this in mind, one very important aspect of Clarke's work for my own research is the ongoing consideration of fluidity and salience in regards to actors and their inclusion in (or explicit exclusion from) certain networks in the field of sustainability at Keele; furthermore along these lines, it must be understood that there are multiple ways to situate an element in the map. For example, the Faculty of Environment Studies (FES) can be both an actor with particular political motivations and positions, a network with multiple political entities, as

well as a discursive force. Finally, the process of mapping Keele's multiple sustainabilities helps to reveal the historical contingency and exigency, rather than an imagined teleology, of knowledge and praxis in the biome as they trace the narratives, movements, interactions of these aforementioned actors. As the narrative unfolds, it tells of elements which move in and out of the terrain and experience varying ebbs and flows of their influence on the overall picture of sustainability at Keele.

Importance of this Work

Following the project narratives of energy and food and the historical construction of their boundaries, I resist the temptation to portray "York University" as a monolithic entity and, more importantly, as either a "leader" or "transgressor" of sustainability. Such a characterization, once again, feeds into problematic conceptions of higher education institutions as singular systems and voices. Rather, by understanding the conditions and networks, comprised of both human and nonhuman actors, which make possible a certain kind of sustainability, my work, in terms of its writing and its methods, could perhaps operate as direct and effective activism. In John Forrester's (2005) study of activists protesting Shell Oil, he argues that even though the company is guilty of multiple human rights and ecological violations, protests targeting such global impacts tend to make little headway in shifting operations because "opposition does not appear to be based on a consistent ideology or analytical understanding" (34).

In terms of Keele, it would not be productive or effective to simply list the reasons why its actors do not operate in accordance with my own particular imaginary of social and ecological sustainability, as such rhetoric would simply dissolve among the multiple networks and projects at work here. By instead beginning to create a climate of interrogation by gathering open-ended data on individual actors and networks, this, my own sustainability project, becomes what

McKay (1996) describes as "simultaneously a negative act" in its ability to help oppose an axiomatically detrimental administrative decision as well as "a *positive pointer* to the kind of social relation that could be" (127, italics from original source).

Figure 1: Keele Energy Sustainability Temporal/Conceptual Map
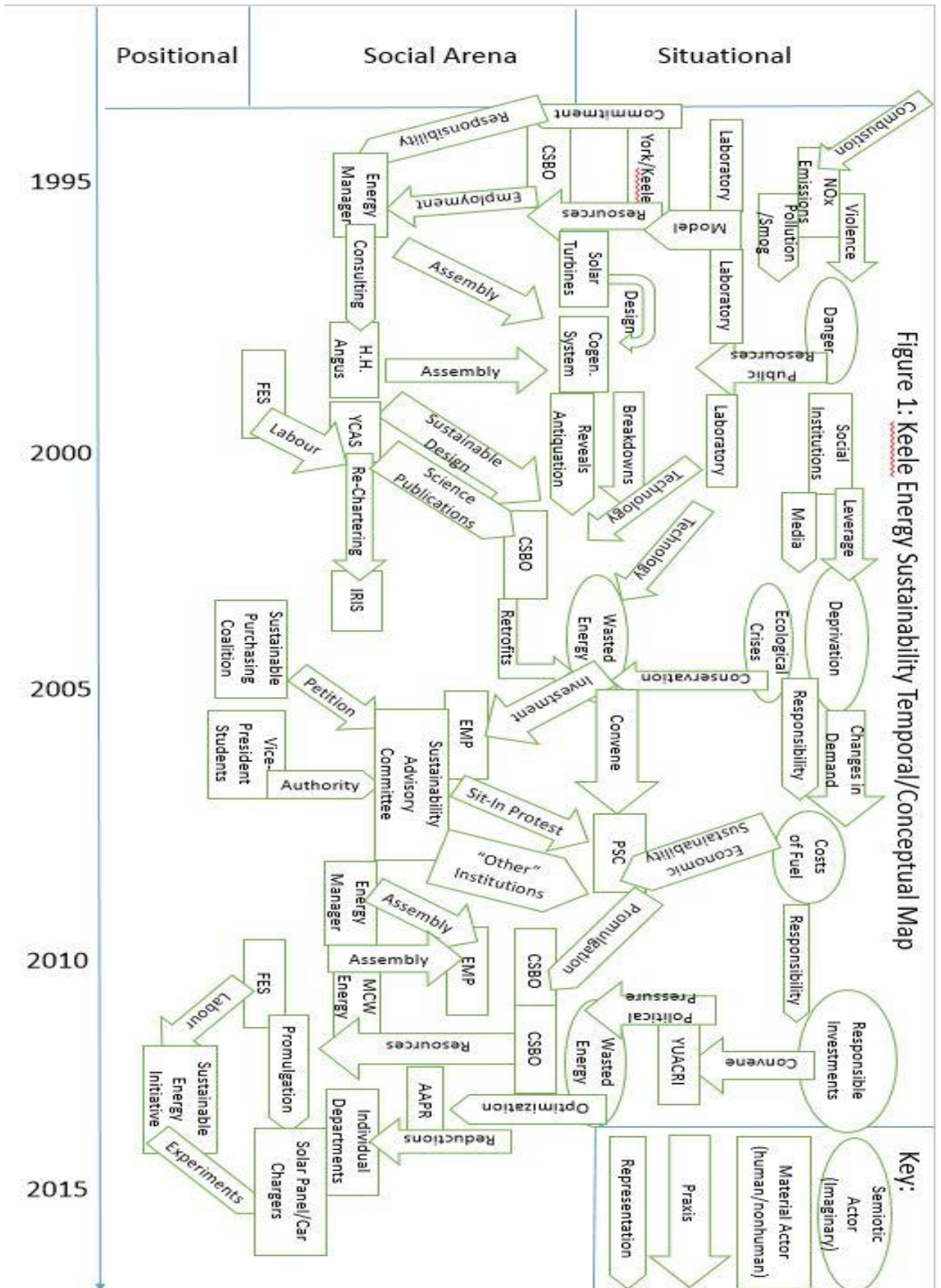
Chapter 3: Mapping Keele's Energy Sustainability

Chapter Overview

In this chapter, I explore energy sustainability praxis and the establishment of its boundaries at Keele. I argue that by tracing my encounters with actors and imaginaries of the Energy Management Project (EMP), I may offer an alternative perspective for understanding sustainability projects as praxis of human and non-human actors which shape what counts as sustainability praxis in its contemporary historical moment. Through my interviews and observations within professional circles at Keele, I have encountered multiple sustainability praxes in operation and found that what often counts as sustainability seems to remain tied to certain techno-scientific imaginaries and actors who adhere to them. These desirable ways of knowing and doing sustainability praxis seem to feed into the perspective of sustainability as teleological while limiting the thinking of its multiplicity and historical contingency needed to ask: *whose sustainability praxis?*

Energy and Sustainability Praxis at Keele

In the winter of 2006, the Office of York University's Vice President of Finance, through CSBO and in coordination with MCW Energy, initiated the implementation of a nearly $40 million Energy Management Program (EMP) for Keele's infrastructure. The project involved a number of architectural and mechanical changes such as the upgrade of the existing cogeneration system for gas-powered heating and electricity, the installation of a steam turbine-driven chiller, and the retrofit of lighting and plumbing systems across the campus.

The idea behind this initiative, according to CSBO, was to lower the operating costs for energy consumption at the Keele campus while significantly reducing the biome's greenhouse gas emissions. These changes and their purportedly associated 25% reductions in energy use represent "sufficient energy to supply more than 4,500 homes with electricity for one year"

(CSBO, 2013a, para. 1). According to the university website and the published findings from the initial study, the five-year project saves the university over five million dollars annually and even increases President Shoukri's "visibility and presentation" of sustainability as the project helps to "showcase innovative, renewable energy technology" to students and the wider community (CSBO, 2013b, para. 6)

In an interview, a senior administrator at York cites the EMP as one of the most significant and successful projects to date, calling it the "crown jewel" of the university's sustainability movement (Robert, Interview, 3 April 2014). The participant, who is involved in overseeing much of the mechanical and architectural engineering projects undertaken by the administration, underscores the importance of the "architects and engineers" who work for CSBO as well as the plethora of "consultants… who bring in their expertise in sustainable practices" for projects such as the EMP.

To this administrator, the techno-scientific knowledges and key political positions held by certain actors within the Keele Campus biome play an important role in "(steering) the PSC in a responsible direction" to obtain "the best results for minimal financial resources." And part of these actors' ongoing praxis within the President's Sustainability Council and other institutional political networks is to "ensure that we (PSC) do not chase things that appear attractive but deliver only minimal or marginal results," citing projects such as wind and solar power generation. According to the participant, sustainability is best defined through ongoing investment into the longevity and efficient performance of existing machinery to preserve future resources rather than incorporating new (or renewable) technologies.

Chapter Thesis and Core Arguments

What counts as a desirable movement of electrons at this historical moment in sustainability at Keele necessitates further investigation. Keele's energy sustainability projects seem to present tacit "solutions" teleologically by drawing from certain techno-scientific and economic imaginaries. By looking at the codes of certain research participants, incorporating documents related to energy, and centralizing my own experiences and encounters of both of their praxes, I can begin to map out the network of energy sustainability (see Figure 1, pg. 32). A clearer picture of the network and who is (and is not) involved within it, helps me to understand the boundaries of praxis demarcated around it which reveal who is allowed, what can be said or done, and what of the multiple sustainabilities has come to count *as* sustainability within it at the contemporary historical moment. Thus, I argue in this chapter that how energy sustainability gets done at the Keele biome is not simply constructed "out there" by techno-scientific knowledges and associated communities concerned with patterns of ecological degradation and subsequently infused into the campus; rather these knowledges and communities make up a few of the *multiple* imaginaries of energy sustainability on which the human and nonhuman actors base their demarcations, maintenances, and ultimate transformations of what counts as energy sustainability and its boundaries at historically contingent and exigent moments at Keele.

To return momentarily to my anchor article in order to develop a better sense of the main issues at hand, Filho (2009), like many authors in the field of Sustainability in Higher Education, presents a number of "solutions" for universities to address the lack of "public understanding" of ecological problems, arguing that "such agencies, sometimes with the assistance of foreign donors, have invested in promoting the increase in knowledge and skills needed for the public to make informed decisions about the use and conservation of natural resources" (1). It would seem

that according to some high-profile scholars in this field, the questions of *what sustainability* and *whose sustainability* have already been answered, namely by imagined scientific and technical communities, while the only remaining questions appear to be *how do we deliver this knowledge* and *how much will it cost*. This characterization of the field on my part may seem rather reductive, as exceptions do exist (see Alvarez and Rogers, 2006), but it remains that this particular perspective of conceiving sustainability in higher education institutions is misguided as it lends itself to an even greater problematic that sustainability is a telos that can somehow be "reached" at a later point in time. As we will continue to see, some scholars and influential practitioners within the campus maintain such a view; as such, the narratives I unfold will help to reveal, for the sake of both groups, ways to understand sustainability in terms of its actors and boundaries. Unlike those conceived by Rockström and Klum (2012) however, these boundaries are demarcated, and thus must be understood, based on individual and group praxis at the level of the biome.

Actors for Energy Sustainability at Keele

Before beginning the situational map of the energy project and develop its historical narrative, I must introduce and establish some of the major actors of energy sustainability in relation to my encounters with them. The PSC functions as a central actor in that it maintains relations with so many other actors in the biome and, as a result, tends to speak for them through its many annual reports and published meeting minutes. Speaking, in this sense, qualifies as action insomuch as it feeds into and legitimizes the sustainability imaginaries, through its access to many of the biome's epistemic communities and knowledges, and thereby maintains the boundaries of allowable praxis, or what "can be done", in the biome. These imaginaries of sustainability, on which its praxis is based, always point back towards their source at a given

moment as the imaginaries incorporate present and future praxis simultaneously, effectively

lending them legitimacy (see Castoriadis, 1997). For example, imaginaries of Robert's natural

gas efficiency seems to draw from both present relationships with energy flows and machinery as

well as from futures of "more efficient" relationships. Despite its speaking role, the PSC is less

involved as an actor involved in the transformation of sustainability, particularly when

considering Robert's comments concerning the PSC as that which "reminds everyone" of

sustainability (3 April 2014). As such, the PSC is also partly responsible for gathering other

actors in the network to undertake projects such as the EMP through its speaking role.

Indeed, speaking is not the same as acting in terms of the strict definition of

transformation that I employ for this study and that is often associated with actor-network theory.

Thus, in the situational map CSBO seems to function as an even more substantial actor alongside

the PSC, as they can often be associated with some of the most significant and visible

transformations at Keele, particularly those associated with sustainability projects. In David's (8

February 2014) discussion regarding the language of sustainability, he claims that CSBO is in

"an institutional position whereby everyone needs to learn theirs (language)." In other words, if

CSBO transforms in ideas and practice, others tend to transform as well. At this point in the

discussion, this seems sufficient enough to justify CSBO's central position on the energy project

map; I will problematize this further later on. Aspects of CSBO's transformations and their

visibility in Keele's various common spaces includes staff members competing in Keele's Green

Office program, faculty members bringing a mug to fill up their morning Tim Horton's at a

discount, or animated signs reminding staff to unplug their computers in the evening.

In addition to the PSC and CSBO, FES occupies a major role in the situational map

because of its numerous planning students and postgraduate planners involved in Keele's

infrastructure planning as well as its Sustainable Energy Initiative to advance research and teaching in green energy innovation. The particularities and uncertainties surrounding solar energy, which feed into the construction of the EMP, can be more richly explored in the second and third map layers. MCW Energy Consultants is also an obvious candidate as they have performed ongoing consultation with CSBO to develop the EMP. The Office of the President of York University, employing a number of important players in sustainability, is another key actor in the making of this project. Both the federal and provincial governments are made visible as actors when they emerge in the field as sources of both financial and regulatory forces.

Involving the state as an actor, however, prompts me to provide an additional qualification for this entire exercise of map-making. The goal of this method is not to create what historian James C. Scott (1998) calls a "metric" of a region which takes a highly mobile social collective and makes it "legible" in order to make calculations based on behaviour. Mapping out social collectives is not intended to reinforce, and thereby legitimate, a certain prescribed optic through which one can view and approach a given social organization. In other words, my intention is not to map, for example, CSBO as a group dedicated to the preservation of fossil fuel consumption through relations with likeminded actors and FES as a group adamantly opposed to carbon emissions in favour of renewable technologies only to have subsequent academics feed into these reductive and unproductive visions. Groups on all sides are complexly nuanced entities filled with individual actors moving fluidly in and out of unsteady alliances and uncertain imaginaries of the social world; the actor *movements* in addition to positions must be made visible as well as historical.

Tracing the Imaginaries of Keele Energy: Situational Map

Utilizing the methodology, I will now develop the individual case study on energy at the Keele biome, through the lens of my own experiences and interviews, as it has transformed in the last few decades. The three methodological map layers of the energy controversy and the EMP reveal many important relationships and praxes which contribute to the demarcation of Keele's energy boundaries. The first map, the situational map, charts out my encounters with the aforementioned major actors modifying the production and consumption of electron energy in the biome.

Documents and interview participants seem to trace the earliest energy sustainability transformations to the installation of a co-generation electricity system beginning in 1997. This system, emerging as a powerful actor in the formations of energy boundaries, produces both heat and electricity from a single natural-gas driven source. It emerged alongside an innovative energy director under CSBO who helped to both ground the project in a specific sustainability imaginary and connect with other major actors. A substantial part of this imaginary was the discovery of, and massive political mobilization against, airborne pollutants of NO_x in the troposphere generated from anthropogenic processes of fuel combustion found in power plants and automobiles. These substances have posed a great risk to human health as they corrode the lungs and greatly increase the risk of chest infections; as such, multiple social and governmental agencies have called for action to reduce them, particularly in the mid-late 1990s when the scientific evidence became widely known (Finlayson-Pitts & Pitts, 1997).

Actors at Keele mobilized to transform campus energy in response to the urgencies of external political actors and the rapidly proliferating imaginary telling of the social, economic, and ecological dangers of NO_x. The two phase co-generation plant project, completed in 2003 by

a network of managers and engineers at York alongside the external consulting firm H.H. Angus

and Associates, has produced 90% less NO_x than the former system; this is due to its ability to

utilize the "waste" heat energy, generated by fossil fuel combustion, as heat for Keele's

infrastructure (H.H. Angus and Associates, 2005). Constructed by the ironically named Solar

Turbines, the cogeneration machines, in terms of their design and purpose, helped to set the stage

for the kind of praxes which would count as "sustainable" in terms of energy sustainability's

many dimensions. Probably the most well-established sustainability praxis at Keele, which is

constantly legitimized by the energy projects and those who experience its benefits, is the

elimination of what major Keele actors consider to be "wasted energy"; such actors have

included the Vice President of Finance and the Vice President Academic and Provost as well as

later sustainability managers for CSBO and the President's Office.

Looking at the narrative from recent years, it seems to have become difficult to perceive

the historical contingency embedded in the construction of energy sustainability and praxis,

possibly due to the embrace of the concept of wasted energy and its associated sustainability

imaginary; simply put, this is the idea that certain kinds of energy production and consumption

are not beneficial to the well-being of the biome. As such, any use of energy outside of this

definition is often suppressed or eliminated. Looking at its historical antecedents from 2005, the

major actors emerged once more for the sake of transformation: consulting engineers MCW

Energy joined the network of the long silent cogeneration machinery, Keele's energy managers

and engineers, as well as the Vice President Finance's Office to transform sustainability with an

imaginary of energy "optimization" to drive them.

Other "external" imaginaries such as the rising cost of fossil fuels (see CSBO, July

2013b) and pressures from other social institutions, higher education and otherwise, demanding

leadership of institutions like York (Barber and Fullan, 2005), also greatly contributed to the new

project dubbed the EMP. According to the CSBO website, the core objective of the project's new

machines, parts, retrofits, techno-scientific knowledges, and human participants has been to

reduce the Keele's energy use and eliminate the idea of waste energy (CSBO, July 2013a); in

this sense, the institution appears to speak as a unified voice *for* sustainability as though its

"established" scientific facts are all that govern energy praxis and the boundaries delineating

what counts as benefit and what counts as waste. As this project progressed however, its

expanding networks of influence took on new actors and new dimensions of historical

contingency and exigency which can only be made visible through mapping and interrogation.

Tracing the narrative further, while looking at how other actors in the biome act based on

more complex imaginaries and historical contingencies, reveals more about sustainability's

boundaries, in an historical moment, as well as its multiplicitous nature which leads to

transformation of these boundaries. In his interview, Robert reveals that one of the main

obstacles of maintaining a certain kind of sustainability, particularly one which is bound to

imaginaries of limiting waste, is ensuring participation among all individuals in the biome.

Robert (3 April 2014) argues, "People pay the bills at home. They don't pay the bills here,"

insisting, like others in the field, that sustainability is limited only by individuals' access to

knowledge, as the knowledge itself is fully intact. And one of the ways to impart that knowledge,

according to Robert, is by communicating economic concerns. He continues by explicating the

relationship between the EMP sustainability project and the institution's recent budgetary

changes, perhaps subtly revealing the ways in which the axiomatic benefits of the former model

have, at least in part, fed into the legitimacy of the latter: "Maybe that's part and parcel of the

new budgetary model here at York. Faculties are more responsible to pay their own way and

become more responsible with their consumption of resources." Robert seems to be referring to the recently enacted policies concerning the Academic and Administrative Program Review (AAPR) project.

This project, alongside the EMP, can be characterized as being part of a complex co-productive feedback loop which effectively strengthens the sustainable energy boundaries. The AAPR reinforces the imaginaries on which the EMP is built in that, simply put, it forces all to justify annually their use of resources (see Monahan, 2010, 21); this is done to ensure that they have not generated waste energy. This directly relates to energy production in that the administration's staunch support of so-called environmental, social, and *financial* sustainability praxes through programs like the EMP legitimize the regulation of what counts as beneficial uses of resources and space. According to David in our interview (8 February 2014), the years leading up to the development of the AAPR were "rife with fights between various groups, namely faculties," for access to space. In an attempt to equalize these groups, major actors such as the VP Finance and the VP Academic presented a policy to have all faculties and administrative departments pay for the space and resources used, thereby basing their value to the institution, and by extension the biome, on the amount of money they accumulate in relation to the resources they require.

The ways of knowing and getting done energy sustainability at Keele, built on imaginaries of certain kinds of waste reduction, seem to demarcate and maintain boundaries of praxis by establishing what counts as beneficial uses of energy while incorporating as many members of the biome's community as possible into these boundaries. Attempting to trace the making of these boundaries and the movement of actors as they cross them allows us to further understand the historical contingency of boundary transformation. Indeed, as we look at the

increased pressure from projects such as the EMP and AAPR, we can see individual faculties, and their associated knowledges and praxes, are able to pull and push on the boundaries by demonstrating the importance of their uses of energy and space, perhaps to the other actors in the network. One example would be the Faculties of Health and Environmental Studies, both of which I have encountered through my work in the PSC, sharing a building with one another and each trying to prove their worth over the other to the administration by introducing various projects and new programs. One clear downside, from the perspective of sustainability activism, with these new relationships emerges when groups such as Keele's research units, namely the Institute for Research and Innovation in Sustainability (IRIS), attempt to transform sustainability on campus through interdisciplinary, interfaculty research and are unable to assemble the networks and obtain their mutual buy-in.

It is difficult, but not impossible, to locate other areas of the EMP where sustainability politics have created transformation and reshaped the boundaries of praxis (I will theorize this further below in the discussion section); one particularly politicized example is the development of solar power on campus. In years following the early constructions of the EMP, solar became a common concern for many individuals and groups at Keele. The senior administrator for CSBO, Robert, ambiguously identifies some of the actors, and their respective imaginaries, whose knowledges and praxes are not always conducive to the boundaries established by actors like CSBO: "it appears to be sexy and people think we should be sprinkling solar panels on all the rooftops." Robert goes on to effectively position, and thereby strengthen, his own sustainability imaginary by including actors at national and global levels in his network:

> "with the current regulatory market in which we work, it would compel us to put in a reverse electrical grid to bring that electricity back to the central utilities grid… feed it into the grid at that point and it would actually flow back onto the campus. You'd have to

invest a huge amount of copper which is expensive from a cost and environmental impact perspective. Think about the copper mines in Chile."

Though parenthetical to my argument, the complex intersubjectivity in his response is noteworthy. Robert believes me to be a supporter of renewable energy simply by my being there and asking questions about sustainability; there seems to be an unspoken recognition of competing praxis, or imperceptible politics as I discuss later on, at work in this matter. Moreover, even though I never mentioned solar power in the interview as a more viable option than natural gas, the latter being Robert's preferred method of sustainable energy production, he seems to partially construct his own imaginary in relation to that which it is not: renewable energy production.

Other areas of the situational map ripe for further exploration in relation to the praxes of energy sustainability, which cannot be explored with due justice in a study of this size, include the "Res Race to Zero", which is an event organized by undergraduate residences at Keele who are challenged to increase efficiency and "reduce our carbon footprint" ("Res Race to Zero," 2014) as well as the Green Office Program which is essentially a competition among various departmental offices for who can operate more sustainably. This latter project seems to be a way for the major actors to strengthen the boundaries through language and symbols which tell of what counts as sustainable uses of energy and what counts as wasted energy.

Discussion and Theory: Situational Map

It must be said that a theoretical problem arises in the maps when we seemingly prioritize some actors over others, referring to them as "major", in a given network. Latour (2005) warns of doing so when using actor-network theory as it problematically prioritizes "what groups and which agencies will… be allowed to fill the social world" (52). There are several remedies to this concern. The situational map, which is intentionally far from exhaustive, includes the major

actors which act *repeatedly*, over the course of time, on a given situation, moving in and out of states of "silence" and "transformation". In terms of the situation above, an actor such as the cogeneration plant itself can remain "silent" for many years until it either breaks down or becomes part of another project and network of actors looking to transform sustainability once more (see Latour, 2005, 79-82); the actors and networks do so through the incorporation of new imaginaries and systems of praxis, often appropriated from techno-scientific communities, such as the EMP which seems to draw from broader notions of "efficiency" as sustainability.

Not only do these "major" actors, such as higher administrators and essential machines, act repeatedly but they also maintain a relationship with other actors over a significant period of time. I have found a possible way to track this by looking at what my participants call in the vernacular "buy-in"; attaining a "bought-in relationship" is a key component in initiating and maintaining a network committed to a particular project. I have noticed it occur when one actor at Keele seeks to transform a particular aspect of sustainability and obtains the approval and partnership of another necessary actor. For instance, the PSC and the Faculty of Environmental Studies provide buy-in for new energy projects because of the nature of their role in the biome. In other words, a project comes to "count" as energy sustainability when it becomes recognized by the actor or actors which are thought to embody a particular concept (e.g. food, energy, the "environment"). This is not to say that a sustainability energy project would not happen without the buy-in from these actors, but it would not necessarily "count" as sustainability much like the ice-cream truck which circulates the campus does not "count" as Keele campus food.

For the purposes of mapping Keele's networks, the ability to achieve and maintain buy-in gives the actors, to use Harman's (2009) interpretation of Latour's metaphysics, qualities of "endurance" (105). Actors in a network, as Latour insists, have an "ultra-concreteness" in that

they can only be defined in terms of their relationship with other entities: the relations change, the object changes. As such, an element's endurance can be tested based on the strength of its relations with other actors. The more buy-in an actor can obtain, I have found, the stronger their relations and, by extension, their endurance. Tracing the relations thusly allows the prioritization of actors on the map to be done by the actors themselves- at least those involved in my project- rather than by my own imposition while giving myself and subsequent researchers an effective starting point for locating and following actors.

An added incentive of conceptualizing the actors this way is a manifest validation of my original thesis in that sustainability is historically contingent and exigent praxis rather than a cumulative process, or most aptly, a *telos*. Like the actors themselves, sustainability praxis in higher education and other institutions often appears to point at a projected future version of itself when both practitioners and scholars are seeking a definition, as though sustainability simply means, "what we do now, except better" (for a few examples see Walton, 2005; Moore, 2005). As Harman poignantly notes that if we want to make such a claim when thinking about how we know and do sustainability, "we might as well claim that neutrons, already 'point' to Belgian mining companies and commando operations" (105). Looking at these actor-networks and the boundaries they demarcate are necessary for beginning to understand *whose* sustainability is being made and who is making the networks and larger bodies "speak" a certain way about it. If sustainability was simply a process driven by a central authority- be it a scientific community or an "informed" political unit- its relationship with other actors in the biome would be, at best, completely superfluous or, at worst, destructive if the imaginaries and praxes on which it bases its decisions are entirely speculative. As is the case with the energy project, the actors in its network may make decisions in the future to make Keele further reliant on fossil

fuels because of the extent to which they have espoused certain imaginaries and embraced certain techno-scientific systems of carbon production. We cannot necessarily expect, or even trust, that a pursued project will be conducive to the well-being of the biome. As philosopher Slavoj Zizek (2010) warns in his documentary, "we don't know the scope of our own omnipotence" (Meerman, Schneider, and Boonstra, 2010).Theoretical concepts from Science and Technology Studies (STS) provide ideas on areas to investigate sustainability praxis in higher education as it is presented by particular scholars and policy-makers versus how it might be viewed in its historical constructions. Sheila Jasanoff (2010) argues that sciences for climate change and sustainability "drive sharp wedges between society's fact making and meaning-making capacities" (243). This concept has resonance with the praxis of the EMP as the scientific imaginaries on which it is based are presented as operating independently of the individual and group politics of the biome; what Latour (1987) calls "immutable mobiles" of scientific knowledge are imported into the biome and presented by major actors as apolitical and teleological next to the highly political processes of policy making. In actuality however, what counts at Keele as sustainability is based on multiple imaginaries and interpretations of scientific "technicity" (Stiegler, 1998) combined with ongoing political machinations and struggles between these various epistemic communities. Both scholars and practitioners often fall into the trap of looking uncritically at how we know and do sustainability science, for the sake of implementation, due to its ability to induce "trust, and its partner credibility" (Jasanoff, 2010, 244). Layering theories from STS onto the work from the field of Sustainability for Higher Education helps to reveal what Jasanoff calls the "master keys" of interrogation to complicate, for the sake of greater understanding, such overly reductive explanations for sustainability.

Another layer of STS theory can be added here to help researchers locate the actors on the edges of the boundaries of sustainability who, through praxis, escape from and effectively transform the boundaries: this theory is that of imperceptible politics.

Building on the concept that sustainability exists as boundary demarcation and transformation through praxis, which demonstrates that sustainability should not be understood as a teleological progression of hierarchically organized transformations of scientific knowledge into social, political, and economic arenas of practice (See Patton, 2000), I apply theories from Papadopoulos et al (2008). According to these scholars, imperceptible politics stimulate political transformation through the excess social relations which emerge out of, and desire "escape" from, a given field's central "regime of control." This central regime of control, for simplicity's sake, can be the boundaries which reveal what counts as praxis and transformation in sustainability at Keele.

This is not to say that this, or any, regime of control has totalizing dominion over every aspect and relationship of the various institutional actors within its respective field; rather sustainability as a field is populated by countless conflicting and independent elements. Indeed, there exists an excess or "plenitude" (Badiou, 2001) of social and material relations, which may or may not operate within these prescribed boundaries, but still operate for the sake of an imaginary like sustainability at Keele. For instance, as energy sustainability transforms and encompasses more actors, new relationships form, whose knowledges and praxes cannot be contained by the highly elastic boundaries, and effectively lead to transformation. According to Papadopoulos et al (2008), the imperceptible politic "instigates change through a series of everyday transformations which can only be codified as having a central political aim or function in retrospect" (76). In other words researchers can follow the historical narrative of certain

projects or controversies and look for the temporal and spatial locations where relations between actors have accumulated to see where transformations have taken place. As these relations only can be codified in retrospect, they are thought to be imperceptible.

An example outside of energy sustainability might be the multiple sustainability praxes surrounding material waste (or garbage) at Keele. A relationship with material waste as sustainability is a rich model for analyzing imperceptible politics considering waste's "everydayness" (Loftus, 2012) and its low techno-scientific value as opposed to energy. While the PSC presents in one of its annual sustainability reports (2013) a waste diversion rate of 65% from municipal landfills through the ZeroWaste project, it does not include the informal networks of material exchanges of unwanted household goods in the residential buildings which I observed while living on campus. In these buildings, imperceptible politics ignite and stimulate the boundaries of what "counts" as representable sustainability. Gradually, these actors become part of the network of sustainable waste projects and effectively transform the boundaries of praxis surrounding it.

Other "excess relations" of sustainability praxis are identifiable in a number of the interviews with various actors in the biome; when asked what makes up sustainability at Keele, participants cite policies for resource protection and certain kinds of consumption; knowledges generated through formal and informal curricula; spaces for sustainability dialogue; flows of biological matter; and networks of faculty, staff, and students; all of which make up the excess of imperceptible politics. As one of my participants who works on the executive of the student environmental justice organization Regenesis@York notes, the many languages of the Keele biome are what drive the politics of sustainability: "I spend a lot of time learning the (faculty) language and consulting their documents… When we were looking at issues of social justice, I

went to Osgoode (law school) a lot. When I went to environmental studies, I learned a lot about conservation and food… while I was there" (David, Interview, 8 February 2014). Whereas sustainability is manifestly stable in a particular contingent or exigent historical moment, these imperceptible politics are constantly on the move.

Another way for researchers to use this theoretical framework to track and understand transformation in sustainability would be to look for what Papadopoulos et al (2008) call its "speculative and fictional qualities" (81) present in the imaginaries of the imperceptible politics. Sustainability, by its very nature, is "absent and yet there" (81) in the sense that it can only be acted upon in terms of its possible futures. For the part of the EMP, the administrator for CSBO, when asked how sustainability is defined, answered with a rhetorical question: "Can what we do be repeated and is what we do, in terms of resources and finances, something that can be continued on through the years without requiring extraordinary application of new or different resources?" The participant implies both an absence and presence of something which is "done" but is, by its very nature, unfinished or partial. In addition, he imagines sustainability as the "doing" or "getting done" of something rather than the "not doing" of something as a means to perhaps conserve or protect something else.

Matthew the President's Sustainability Coordinator, another key actor in a number of PSC projects such as the EMP, operates along similar imaginaries, arguing in an interview (22 January 2014) "It's inevitable that York will continue to get bigger, so we really have to focus on how we grow. So to me, it's probably not an option to not do things anymore." Like many other members of administration at Keele, as seen in both interviews and published documents on sustainability projects, Matthew imagines sustainability as not only eliminating "waste" but also encouraging "growth." Though I could continue to philosophize the point at length, my

underlying argument here is that researchers in the field can track the transformations of sustainability boundaries by comparing the languages of these imaginaries with those of the new actors who become part of certain networks to discover which possible futures, upon transformation, have come to count as sustainability.

Increased representation and expansion of the networks of the EMP, specifically into more faculties and administrative groups, create more opportunities for praxis of new imaginaries to bring about transformation through the accumulation of social relations. Thus, to use these new layers to build on Jasanoff's (2010) point mentioned earlier, the heavily-represented and technically-grounded fact-making capacities of Keele's energy sustainability actors simultaneously limits and establishes necessary conditions for the meaning-making of other epistemic communities found within the biome. In other words, as administrators try to limit and bind what counts as sustainability in the biome, more possibilities seem to accumulate and escape to become new praxes.

The presence of imperceptible politics is readily identifiable when I ask Robert if he has to contend with competing visions of sustainable energy at Keele, to which he replies: "all the time." When compared to an interview with another senior administrator, it is apparent that the major actors such as the PSC and CSBO as well as their network which encompasses the EMP project, in their efforts to demarcate and maintain a certain kind of energy praxis within certain boundaries, make possible transformation through the emergence of alternative imaginaries. When asked about the work in sustainability that York and the PSC are best positioned to achieve, this administrator, Matthew, discusses the possibilities for energy: "we teach students about solar, for instance, through the Solar Energy Initiative and can we come up with a solar

installation on campus that students can actually learn applied sustainability from on campus"[1] (Matthew, Interview, 22 January 2014). It would seem that the excessive social relations between other actors- working groups, research projects, student activist organizations, committees- surrounding the sustainable energy void and represented, to some extent, by the PSC, have created new trajectories which effectively redefine the boundaries of praxis, and by extension the particular sustainability moment, at the Keele biome. This has occurred to such an extent in regards to the production and consumption of electron energy, that both Robert and Matthew indicate the plans to implement solar-powered car-charging stations within Keele infrastructure.

Tracing the Imaginaries of Keele Energy: Social Arena Map

I will now begin to construct the second map using Clarke's method, which involves "literally drawing lines" (569) between two or more major groups I have encountered to discuss their relationship; doing so also means zooming in on the social arenas and more specific forces of influence which seem to steer negotiations between two or more actors in a project. This is where we begin to make visible some of the actors' politics by looking at how they operate in their spheres of influence and create the relationships necessary for transformation in sustainability. The line between the Office of the President and CSBO would be an apt starting point because a number of interview participants have cited these as starting points *for* the politics of sustainability at Keele: Robert (3 April 2014) mentions "(sustainability) starts with the President" while Matthew (22 January 2014) attributes widely-recognized sustainability developments recognized as those of CSBO. However, as the proposal to create the EMP predates both the current president who initiated the PSC and the current administrative heads of

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[1] The Solar Energy Initiative does not exist at Keele. After a follow-up, it seems he is referring to the Sustainable Energy Initiative found in the Faculty of Environmental Studies.

CSBO, it would make sense that the project network has integrated a number of key actors in various social arenas preceding these individuals' participation.

As Clarke warns with this map, it is important not to "assume directionalities of influence" in the map and allow the situations to be "open and porous" (560). Thus, a number of social arenas of influence must be opened up to the rest of the analysis in order to explore their influence on the larger map. Nearly contemporaneous to the developments of the EMP, university groups began assembling actors of students and faculty to form the York Coalition for Responsible Investment (YCRI) to call for the monitoring of, and divestment from, socially and ecologically problematic organizations through an executive advisory committee adjacent to the board of governors. In addition to urging the administration to sign third-party documents which compel corporations to disclose practices such as carbon extraction to investors, 2008 saw the first annual disclosure of York's own investment portfolio to the online public (Canadian Coalition of Universities for Responsible Investment, 2013).

One of the student members interviewed, Aaron, explains that investments are comprised of pension and endowment funds, the latter being held by York's Board of Governors who monitor but outsource the direct management of funds to various investment managers at external firms. He argues "it is certainly the role of the York community to tell the university what they should and should not be investing in," citing problems of oil and arms investments. In 2012, this coalition broke its subsequent "silence" in gathering other actors to form the York University Advisory Committee on Responsible Investing (YUACRI) which, along with a university-wide ban on the sale of bottled water, the senior member of the PSC called one of Keele's "most successful projects" and that which "concerned" him the most when he first joined the council (Ethan, Interview, 31 March 2014). The narrative tracing the praxes of these actors is

far from simple, however, as imaginaries of sustainable involvement by such a small entity as

Keele in global affairs which have implications at a geologic scale manifest multiplicitous and

"messy" policy and praxis trajectories. Projects and policies such as "The Responsible

Investment Project" and "The Responsible Investment Action Plan" as well as the network of

actors which comprise the YUACRI warrant further data collection and analysis to better situate

them in the map. Though the particular ways in which the sustainable investment project pulls

and pushes the boundaries of Keele's energy production and consumption remains unclear, it can

be said for certain that the "synergy and overlap" with which Robert (3 April 2014) claims

financial and resource sustainability operate in regards to projects like the EMP is far less

teleologically-driven as it seems at first glance.

Another social arena that should be explored further is the seemingly anomalous

relationship that FES has in advising and guiding the policies of CSBO. In her interview, Ellen

(25 February 2014) describes the unwarranted participation of FES in projects outside of its

purview:

> "They have a mandate to teach courses and discharge their curriculum. And they have a mandate to support the research of their professors, their faculty, but that explicit mandate does not include, or any of the researchers on FES, is to engage colleagues from across the university, whereas that is the top explicit mandate of an ORU (Organized Research Unit) like IRIS."

Though a number of points have already been made on FES as a prolific actor in these networks,

Ellen does elucidate a much bigger concept. Networks generated at the level of the biome not

only demarcate what it means to "do" and what "counts as" sustainability at a given historical

moment, but also what it means to do and what counts as a faculty, a research group, a

department, a dean, a student, or a staff member. New possibilities on what historically

constitutes an actor in projects at Keele await further data collection and analysis while proving the importance of understanding sustainability through the optic of these biome maps.

Nevertheless, these revelations help us to dig further into the narrative. A number of participants in my study discuss the actors who connect with FES for sustainability praxis. David claims that individuals hired onto Keele's administration from FES have "drunk the Kool-Aid" (David, Interview, 8 February 2014) while a senior member of Keele's faculty identifies a trend of FES claiming that they "should be the gatekeepers and guardians of sustainability research" (Ellen, Interview, 25 February 2014). Robert reveals that CSBO has "people who study in FES; our waste management coordinator has a degree from our own faculty… We bring those people into the discussion" (Robert, Interview, 3 April 2014). Based on my encounters with these actors, I would argue that as these networks grow, there is a more concerted effort to determine what counts as sustainability praxis but, as I argue, with further questioning of *whose* sustainability, there is also more opportunities for other sustainability praxes to disrupt and transform it.

Perhaps the most influential actor within FES's sphere of influence is the academic field of urban planning. Within FES, this popular field of study offers a degree which explores "the intersections of social, economic, political, and physical environments, shaping our well-being and that of others, both human and non-human" (York University Department of Planning, 2014, para. 2). Certain projects for doing sustainability at Keele based on knowledges and imaginaries found in the planning field, which were quickly appropriated and supported by multiple PSC and CSBO actors, have served to help demarcate the boundaries of sustainable energy praxis at Keele. Projects such as a map of Keele's "natural features" (PSC, 23 February 2010), a "Green Map" highlighting Keele's "sustainability features" (PSC, 3 November 2011), and a "Sustainability Office" which, according to Ethan, is a "permanent space… for students to be

engaged" with sustainability serve as examples of such projects (Ethan, Interview, 31 March 2014).

Discussion and Theory: Social Arena Map

The theory of imperceptible politics helps to develop an understanding of the conditions for transformation in sustainability praxis at the Keele biome; yet this is but one half of the theory. Latour's (2004) *Politics* helps us to understand the relationship between certain imaginaries and the praxes of the epistemic groups who take on roles as actors in sustainability projects. Additionally, this framework helps to take a more in-depth look at how imaginaries become bound to certain arenas of influence, allowing various actors to connect in project networks. Latour (2004) also helps us to reposition the historically constructed Planetary Boundaries as *one* of these imaginaries which create a certain arena of influence.

Before I move on to Latour's (2004) theories on the matter, I must explicate further some aspects of the Planetary Boundaries (PB) framework which correspond with certain active imaginaries influencing the production and consumption of electron energy at Keele. The PB framework upholds the concept of the so-called Anthropocene which posits that humans have become the most influential ecological force on the planet and, as such, we are collectively positioned to both bring about and halt approaching paradigm shifts in socio-ecological stability. According to Rockström and Klum (2012), electron energy demand in global markets directly pressures limits to stable atmospheric carbon levels and ocean acidification capacities as well as, to a less direct extent, levels of biodiversity loss, chemical pollution capacities, aerosol loads, and uses of freshwater. Many of these boundaries have been demarcated at Keele via the EMP and are visible in its publicized documents which describe the "cogeneration of heat and electricity" and the new "water fixtures" to decrease domestic water use. Of course, actors in the

Keele campus are unlikely to use the PB framework as a guide for developing sustainable processes at the Keele biome; I am interested in understanding how these sets of ideas and possible futures become linked to certain influential groups in the biome for the sake of sustainability projects and praxis.

Based on my encounters, institutions like York's Keele campus seem, in many ways, set up to ensure that only certain individuals can access techno-scientific imaginaries *and* act on them in sustainability praxis. To elaborate, Latour (2004) critiques political ecologists who persistently maintain a conceptual division between "two houses" of nature and politics in order to provide a disciplinary bridge between the two (9-31). Latour insists that these scholars must renounce the study of nature as a particular sphere of reality and understand it as the "result of a political division… that separates what is objective and indisputable from what is subjective and disputable" (231). In other words, the concept of nature cannot be introduced into politics, as political ecologists claim it can, because the very notions themselves are constructed to distance the latter from the former in places of policymaking in order to ensure only certain individuals, namely scientists, can apply these imaginaries in praxis.

As I am not interested in evaluating an additional academic discourse active at Keele, Latour's (2004) critique of political ecology can be applied to Keele's Faculty of Environmental Studies (FES) whose success and power as a discipline relies on the persistence of belief in these two distinct spheres of reality (nature and politics). Indeed, a number of interview participants seem to subtly identify their role in maintaining this belief; Ethan, who is a member of the FES faculty and the PSC, defines sustainability thusly:

> "In FES, we have a very broad definition of sustainability in order not to limit it. It's not just a question of natural environments, but those in a larger socio-economic environment… So we do have a commitment to a holistic open definition, and as the working groups change, new issues come up and new emphases come up."

Judging by this definition, Ethan appears to extend his particular imaginary and praxis, into other areas of sustainability praxis, namely the working groups which make up the PSC. It stands to reason that certain members of FES maintain a wide sphere of influence because of this maintained distinction and their exclusive access to scientific imaginaries. Thus, I would argue that the ability of a given actor or set of actors to deploy techno-scientific imaginaries as a means to further link, and thereby justify the continued formulation and division of, spheres of politics and nature is a determining factor in their ability to disrupt and transform what counts as sustainability at a given moment. In other words, it would seem that certain actors within FES, at least when acting in a particular sustainability project, operate as though there exists a separation between politics and nature in order to help define praxis for sustainability and demarcate its boundaries.

However, such a model for thinking about how we actually know and do sustainability, which is ultimately teleological and not accounting for multiplicity and contingency, does not seem conducive to an understanding of new possibilities of transformation through the multiple sustainability imaginaries, linked to various influential actors and praxes, at Keele, CSBO and FES's ability to speak with such an authoritarian voice provides it with its influence in shaping the boundaries, but a situation whereby they simply extract scientific information and apply it to praxis is not grounded in reality. Moreover, science, like sustainability, does not progress teleologically and, as such, cannot actually be summoned by a set of actors for the cutting-edge "facts" which said actors may appear to apply to a given project.

Rather scientific knowledge is historically contingent and exigent depending on, as Hulme (2009) maintains, "where science is practiced, by whom, and in what era" (78). Actors introduce and mobilize certain kinds of scientific and technical knowledges within a biome and

their effectiveness seems to depend, at least in part, on their ability to uphold a distinction of "nature" and "politics" spheres rather than on their completeness or certainty.

As these ideas are complex, and perhaps not fully formed, they warrant an example: Murphy's (2012) study of an extreme weather disaster explores the formation of a group of affected actors from various areas of technical expertise creating a sustainable plan for future weather disasters following an ice storm of 1998 in Quebec. The position of scientists operating between two constructed spheres of nature and politics is evident in Murphy's paraphrasing of the commission's effects: the group "was effective in clarifying the issues and in reassuring the population in the context of uncertainties engendered by primal nature's construction of freezing rain in an electrically dependent and vulnerable society" (68). In terms of the Keele biome, a certain teleological and technocratic perspective, present in some scholarly and practitioner discourse, on how we know and do sustainability, often while upholding a distinction of spheres, seems to have become influential in legitimizing certain imaginaries, constructing certain kinds of sustainability praxis and, more importantly, determining who regulates that which counts as said praxis, specifically in regards to energy projects like the EMP.

These types of projects, and the knowledges which underpin them, echo the subject of Latour's critique of political ecology in that the projects are conceptualized in such a way to ensure "nature" does not enter the "political" but certain members of the political realm may freely enter and leave nature as they see fit. Thus, it can be said that these ways of thinking are teleological in the sense that the goal of the political sphere is to "fix" the sphere of nature. In Latour's (2004) words, projects associated with the school of political ecology, or a certain perspective within FES and other parts of Keele, have constructed a sphere "which would have authority and not speak, while the other would have speech and no authority" (17).

Tracing the Imaginaries of Keele Energy: Positional Map

One final aspect of the methodology is necessary before moving on to the next sustainability project; zooming in another level on the positional map allows us to reveal the contradictions as well as silences pertaining to positions taken, or not taken, by actors. As Clarke (2003) informs us, these silences and contradictions reside within "both individuals and collectives" (560); both seem to be present in the individual and group actors of the EMP. The most readily-available example would be solar energy praxis at Keele as the actions and modifications driven by pervasive solar/renewable/green imaginaries manifest a great deal of uncertainty among major actors; this is reflected in their positions. Indeed, it is presented by CSBO and other administrators, at the very most, as a pedagogical tool in its use in the engineering school or, at the very least, the business of external actors and networks such as the provincial government or private electric-car owners partaking in the incoming solar-powered car-charging stations, according to Robert and others encountered while sitting on the PSC. New revelations on the fractured knowledges which feed into imaginaries of sustainable energy, not limited to an overly simplified dichotomy of renewable energy versus fossil fuel energy, are made available by further opening up analysis to the "full range of positions" (560) available in this project and its network.

Final Thoughts

It seems that the idea put forward by scholars in Sustainability for Higher Education like Filho (2009), as well as practitioners within higher education institutions, that sustainability is constructed as a mere teleological progression into better and "more scientific" praxes, is a limited model, particularly when applied to the Keele campus. Sustainability, rather, is praxis constructed from highly complex political relationships between actors and transformations of

boundaries undertaken at historically contingent and exigent moments. Before proceeding to the next chapter, I must make clear, if I have not heretofore done so, that I am attempting to understand sustainability at *Keele* and nowhere else as my project is not meant to be taken out of this context and applied to other biomes or, worse yet, higher education institutions for the sake of the dreaded "best practices". To apply Latour's (2004) poignant counter-argument directed at potential critics, "I am not interested in refutation" in developing a particular understanding of sustainability, "but in proposition" (12). This is not a project on how to "do" sustainability but one which looks at how sustainability "gets done." The best way to do so, is to begin from the ground up both theoretically and methodologically.

In my next chapter, I continue to map the Keele biome while exploring how knowledge of food systems bring together a network of actors devoted to "local food" imaginaries and work to rigorously demarcate particular boundaries of praxis based on these speculative foundations. I will continue to argue that sustainability at Keele is not a teleological process governed by an overarching progression of scientific/technical knowledge and mediated by scientists and technical experts; rather it is an observable field comprised of complex networks of human and nonhuman actors, some of which come to "count" at the biome through their historical contingency and exigency.
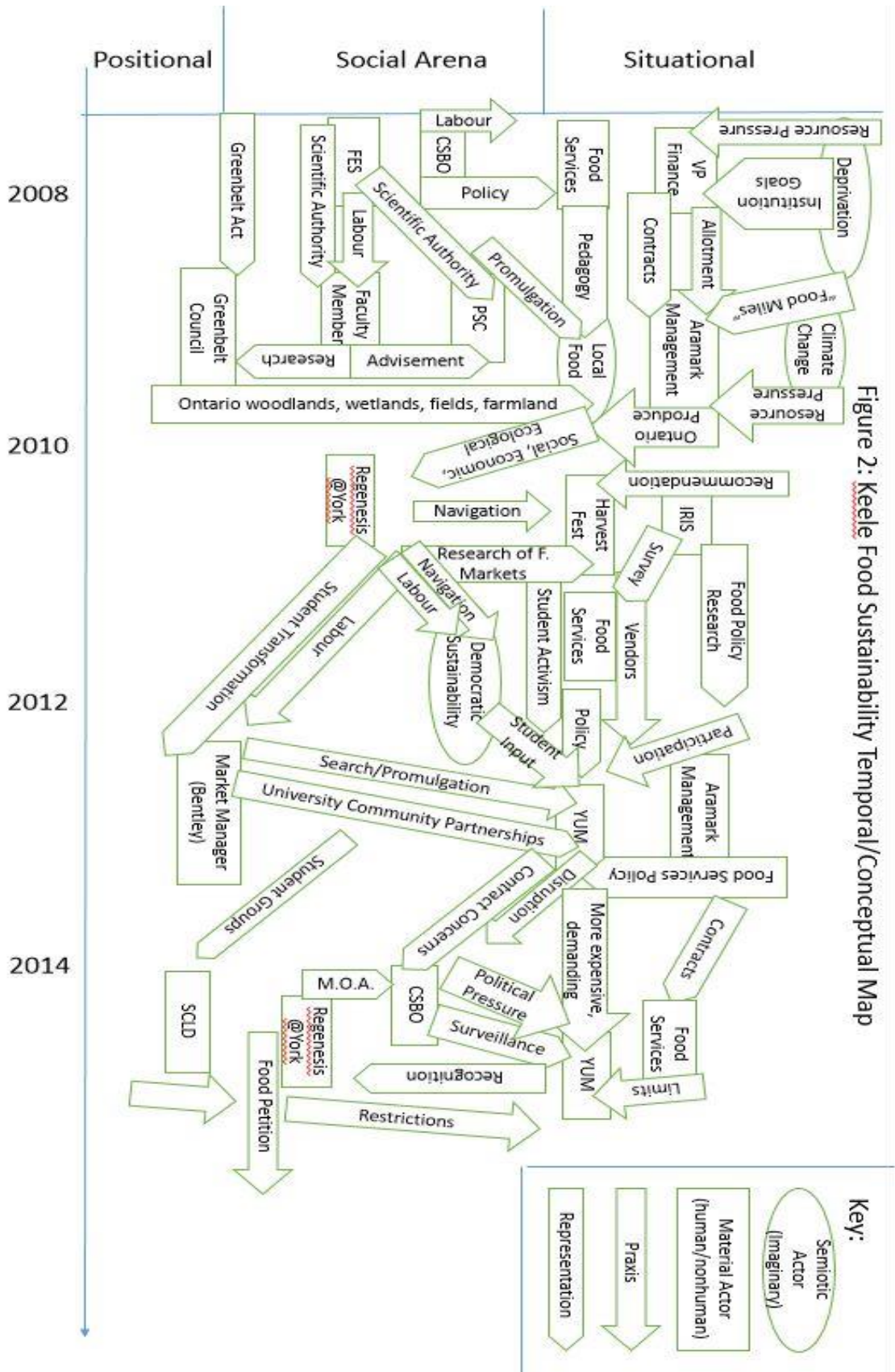
Figure 2: Keele Food Sustainability Temporal/Conceptual Map

Chapter 4: Mapping Food Sustainability through a Campus Market

Chapter Overview

Taken from the perspective of my position as manager of York's first farmers' market, this chapter traces food sustainability praxis at Keele as a larger food localizing project and the efforts of actors involved in its construction. I argue that the sustainability praxis of local food production and consumption can be best understood as an historically-bound moment in which certain praxis is deemed to count among those of multiple actors and imaginaries of food-related, socio-ecological justice and well-being operating at Keele.

Food and Markets at Keele

In November of 2011, Keele Campus' Central Square, known affectionately as the "Bear Pit", hosted the University's first-ever Farmers' Market featuring eight vendors serving a combination of hot food, baked goods, freshly harvested produce, and non-food craft items. The market, called "York University Harvest Fest", was a single-day event which saw hundreds of attendees and generated $1500 in revenue for vendors. According to its four student organizers (Koroleva *et al,* 2010), the event was meant to "address the lack of diverse food options on campus" while simultaneously "promoting local farmers and educating students about… the importance of buying local fare" (1). Unbeknownst at the time, the event's success would greatly shape the trajectories of sustainability at Keele for years to come.

Following the market, Regenesis@York, who helped the student organizers gain funding and administrative support, began working to develop a permanent market at Keele with the support of the PSC and CSBO's Food Services department. As multiple conversations took place between PSC, CSBO, and Regenesis, evidenced in the PSC annual reports and my own participant interviews, questions of "whose market" gradually became linked to larger questions

circulating within Keele regarding local food and food policy. From its early stages, the concept

of a permanent food market developed as a co-construction of these players' respective desires

for and imaginaries of food sustainability in the biome. In 2012, these conversations leapt

forward as Timothy, the director of CSBO's Food Services, joined the PSC and leant his support

to the project while working to define its boundaries in the form of multiple written and

unwritten policies.

One year later in early 2013, I entered the project through Regenesis, taking on the role of

market manager, and began to establish its formative characteristics based on these earlier

conversations. This work included recruiting appropriate vendors, functioning as intermediary

between their needs and those of Keele's key project actors, and consolidating resources to

create a space conducive to their collective visions. Months later in the fall of 2013, nearly two

years after the original harvest fest, York University Market (YUM) opened at Keele's

Technology Enhanced Learning (TEL) building and took place every Thursday afternoon from

November to April. The market began as an assortment of a dozen vendors, growing to nearly

thirty in April, selling goods ranging from fresh produce, prepared frozen meals, and hot food to

student artisanal jewellery and home-made cosmetics. After a successful and acclaimed season,

YUM was approved to continue in the 2014/2015 regular terms with a number of important

provisions and even unresolved contestations.

The PSC (2014) Annual Report reveals a seemingly teleological trajectory on which the

committee and other administrators have positioned the market in York's sustainability agenda:

"The market was a notable success… providing York community members greater access to

wellness products and a variety of healthy, locally-grown and farm-fresh foods. The plan is to

continue to organize the Farmer's Market (sic) next year by integrating it into the university's

broader food services program" (PSC, n.d.). As we shall see further, the York University Market quickly became presented as part of the institutional "answer" to food-related ecological crises in spite of its highly contested and politicized formation.

Chapter Thesis and Core Arguments

Drawing heavily from personal experience, as well as participant interviews and limited documentation, I use this chapter to trace the narrative of York University Market to begin to make visible some of the network of actors involved in its emergence and construction in the contemporary moment. I argue in this chapter that the story of YUM opens up investigation into and further data collection for understanding the development of food sustainability praxes at Keele; the particular perspective which tells of the university's "progress" in enacting policies and praxes of local food procurement seems to indicate an addressing of the dire questions society asks of higher education institutions. These imaginaries of local food tend to be widely recognized by comparable institutions and become teleological in form, providing "answers" while failing to ask critical questions regarding *whose local food* and *what local food means* for the Keele biome; such questions, which are the basis for this chapter, help me to gain further knowledge into the process by which actors form networks on behalf of food and demarcate the boundaries of praxis which come to govern how food "gets done" at a given historical moment.

Filho (2009), arguing a particular perspective from the field of Sustainability in Higher Education, identifies education for sustainable development as the most promising step towards society meeting the present and future needs of the public; delivering this education is done through collaboration between institutions who share similar visions for equitable, ecological, and economic prosperity. To generate collaboration, Filho suggests that "institutions should encourage empowerment through incentives, such as reorganizing for optimal outcomes,

increasing access to community resources, and symbiotic local relationship building" (3). In other words, knowledge for sustainability is not only obtainable through social relations, but can be conducive to fair and democratic praxes which incorporates all-human and nonhuman-members of society.

To me, these concepts demonstrate a way of thinking about sustainability praxis which reflects a desire to maintain the outcomes of current relationships of food production and consumption with policy to obtain what we obtain now, except through "better" means. In his interview, Robert (3 April 2014) seems to mirror Filho in his own definition of sustainability as applied to Keele: "Can what we do be repeated and is what we do, in terms of resources and finances, something that can be continued on through the years?" The implication here is, at least for the purposes of this project, that there exists a perspective among both scholars and practitioners concerned with sustainable development that there *is* a set of tacit policies and praxes which can and should be "repeated" and, more importantly, that scholars and practitioners should come to "know" them and "get them done". In regards to food and other areas of sustainability, this line of reasoning seems to be the precursor to the demarcation of a project's boundaries of praxis determining what or who is allowed into the network to participate and contribute ideas.

Actors for Food Sustainability

As I did with the previous chapter, I will begin mapping this sustainability project (see Figure 2, pg. 62) by discussing the actors in historical context before moving onto mapping out their arenas of influence and positions taken. The major actors involved in local food projects include CSBO, PSC, as well as IRIS (Institute for Research and Innovation in Sustainability) who conducted the (2009) report Examining Campus Food Sustainability at York University and

brought it before the President and his council (see Morris et al, June 2009). Other major actors include the York University Development Corporation (YUDC) who leases out space to vendors, York Federation of Students (YFS) who partly operates the student centre food outlets through a board of directors, Food Services who designs programming for campus food and subcontracts the actual management and operations to Aramark, the catering organization, and various independent vendors.

Although Food Services is a unit of CSBO, it is appropriate to consider it a major actor in food projects for three reasons: because of the recent changes to York's budgetary model, the department is compelled to make decisions conducive to its respective economic and political gain. Additionally, Food Services has generated a great deal of endurance within its various project networks because, as I defined in the previous chapter, it has developed buy-in from a number of different actors at Keele for several sustainability transformations. These actors include student organizations like Regenesis@York and Health Education and Promotion to staff groups like the President's Sustainability Coordinator and Student Community and Leadership Development, all of whom have been involved in YUM. Finally, Food Services tends to act repeatedly in transforming exchanges of food within the biome to ensure it is nourished in a sustainable way; in my interview the director of Food Services, after identifying multiple projects such as cage-free eggs and eco-takeout containers, reveals his imagined future of food sustainability at York: "we are trying to evolve it into a more program-based operation… delivering programs around healthy eating, nutrition, sustainability and social awareness, things like the vegan Mondays and the YUM market." By these criteria, Food Services, CSBO, PSC, Regenesis@York, IRIS, and Aramark are all major actors in the local food project and YUM.

Imaginaries of sustainable food are connected to individual and group actors outside and adjacent to the biome, rather than simply within the biome itself, who contribute to the expansion of project networks and the demarcation of boundaries. I am referring specifically to inhabitants of the so-called Greenbelt Region of Ontario which is an area of protected green space, forests, agricultural land, heritage sites, and wetlands surrounding the Golden Horseshoe, southern Ontario's most populous and fastest growing region (see *The Greenbelt Plan*, 2005). Keele actors have demonstrated their commitment to both a realistic and imagined symbiotic relationship with Greenbelt actors, not only in the IRIS report (see pg. 5), but also in their various imaginaries and praxes. FES faculty member and former dean Peter Victor, an economist specializing in environmental management, serves as the chair of the Greenbelt Council and, as such, advises various government and corporate agencies on its use and protection. Interestingly, Peter Victor led the earliest vanguard for sustainability investigation at Keele ordered by the former President, Lorna Marsden, which culminated in the first sustainability report (see Planning, Budget, and Accountability, 2003) and subsequent pressure on other members of Keele, not least of which the PSC and CSBO, to practice sustainability. Though the connections between FES and local food imaginaries warrant further investigation, it stands to reason that relationships around local food would develop between Green Belt affiliates and these major Keele actors.

Indeed, one of Keele and Food Services' main food providers, Aramark, holds a contract with a Greenbelt distributor called Bamford Produce who aggregates farmed produce and distributes it to various institutions around Southern Ontario including the Keele Campus. Parenthetically, Bamford Produce and Aramark treated some of the more influential people in food decisions at Keele, myself included, to an expenses paid tour of farms and produce

processing plants in the Greenbelt. Via an SUV limousine, we travelled to a plant in Bradford,

Ontario overseen by Bamford which specializes in cleaning, sorting, and shipping primarily

carrots, potatoes, and onions to be sold in supermarkets and institutions like the Keele Campus

around the province. We then proceeded to Bay Growers, an apple orchard monoculture, which

is responsible for growing, cleaning, storing, and distributing millions of apples at any one time.

It was through the relationships developed on this trip that several student groups, as well as

Aramark themselves, became part of the YUM and subsequently established a permanent booth.

This development was an outcome of both the positive relationships I established on the trip as

well as the pressure by Food Services to include them in the market.

Since the development of the IRIS food report and the establishment of the PSC in 2008,

it has suited the interests of Keele's actors to maintain its local food relationships by demarcating

certain boundaries and enacting certain policies to limit food providers whose praxes may fail to

meet certain imagined standards of sustainability. These policies, which help to enrich my

situational map by adding more complex discursive elements, were part of the recommendations

on IRIS's (2009) food report as well as the subsequent annual reports of the PSC. According to

the former report, "York University should develop a food services policy that prohibits the use

of external food service operations on campus…. By doing so, vendors would be more

economically viable… thereby enhancing campus experiences and other sustainability

initiatives" (29). The policy is similarly worded on the PSC annual reports, a noteworthy

inclusion in reports on sustainability, which recommends the PSC develop a "food services

policy that protects the investments… by restricting on-campus catering and food service

provision to (those) that are contracted, permitted, or otherwise authorized by the University's

Food Services Office (York University Office of the President (YUOP) 2010a, 4; see also

YUOP, 2010b). Since these reports were published, the policies have been enacted gradually by Keele administrators and members of the community.

Despite this gradual legitimization and acceptance of restrictions among the Keele community, Food Services has remained unable to govern two of the most popular food establishments, York Lanes, overseen by the highly exclusive York University Development Corporation (YUDC) whose corporate clientele is subject to very few internal regulations, and the Student Centre, operated by an independent Board of Directors. Nevertheless Food Services' policies and praxes, which set limits on whose local food counts as sustainable food, came to the fore much more visibly following the emergence of Keele's local food project's most recent actors: YUM, Regenesis@York, and myself.

Discussion and Theory: Major Actors and Situational Map

The desire for sustainability through the incorporation of more local food at Keele, which effectively brought these actors together, can be traced back to IRIS's (2009) food report. This study, undertaken in 2008 and 2009 in conjunction with the director of food services, outlines the myriad food policies and producers operating at Keele, often working against one another and the best interests of its consumers. Though much of the report is inconsequential to my project, it provides evidence of some of the ways of knowing and getting done food sustainability among the aforementioned actors including the incorporation of organic food, fair trade products, biodegradable packaging, and most importantly local food. Imaginaries of local food seem to form the basis of subsequent transformations undertaken by this network of actors; these imaginaries, mentioned in the IRIS report, seem to frame local food as the solution to overuse of pesticides, reliance on synthetic fertilizers, monoculture, and so-called "food miles".

Though scholarship on food sustainability in higher education institutions is minimal, there are academics of public policy and pedagogy who seem to mirror the desires of Keele's administrators and practitioners for local food, teleologically equating more local food to more sustainable food systems. McEntree (2010) identifies both a "traditional local" and a "contemporary local" imaginary among communities in the United States who seek out various outlets for local food such as community gardens and farmers' markets. "Contemporary local", according to McEntree, "is characterized by tenants of food localization that have become somewhat standard wherever local food organizations and groups exist" (788) and adherent to "an explicit commitment to social, economic, and environmental sustainability" (789). Other scholars such as Born and Purcell (2006) identify this imaginary and warn of the "local trap" which engenders class division and ultimately leads to social, as well as ecological, tension. Regardless of the legitimacy or effectiveness of local food movements, as exploring those aspects are not my aim in this project, these imaginaries tend to lend themselves to certain kinds of questions being asked of epistemic communities such as higher education institutions by publics who desire their reification. These questions, like those being asked in the name of sustainable energy systems, tend to be structured as *how* to make local food sustainable and *how much* it costs, rather than *whose* local food it is or *what* its boundaries are (Peters et al, 2008; Timmons et al, 2008; Cowell and Parkinson, 2003; Coley et al, 2008).

Tracing the Imaginaries of Keele Food and YUM: Social Arena Map

To continue this discussion, having outlined the situational actors and imaginaries in the local food project, it is necessary to begin to construct the second map which expands on the connections between these actors and the spheres of influence in which they operate. Since the initial construction of the York University Market in the fall of 2013 and into the winter

semester, it was clear that Regenesis@York and I were not always operating within the boundaries of "acceptable", or that which counts as, sustainable praxis. For example, the event was booked by Food Services as a catering event under York University and CSBO policy, despite Regenesis executive David's insistence on its permanence and critical role as a precedent for bigger and better things. He mentions in the interview: "The market has done different things by critically expanding our reach, making us a household name at York. It resonated with campus services by making us look serious." He continues by projecting the trajectory the market and other Regenesis projects will take: "we'll control sustainability policy at the university. I'm not saying that's what we'll set out to do, but that's what'll happen." In Regenesis@York's own reports, correspondence, and website, they refer to YUM as their initiative which is supported by Food Services and CSBO.

Despite these sentiments, Food Services have insisted frequently on YUM's designation as a "pilot project," citing it as such in the PSC annual reports (see YUOP 2013; YUOP 2014), and mentioned how it must be incorporated more into Food Services' broader policy and programming if it is to continue. In several meetings, they warned us that market food must be "local" and complained when one of the vendors sold Kale from the United States, despite the need for small-scale farmers to adhere to soil and climate, in addition to proximity, concerns. For the fall semester of 2014, Food Services have essentially relieved me of my market management duties in order to appoint one of their own employees to take on the position. Additionally, in a monthly PSC meeting, a CSBO administrator mentioned that the market should focus less on food and take on more qualities of a "flea market" than a farmers' market.

I would argue that these pushes and pulls of Food Services and CSBO were not necessarily a matter of gaining sole power over food sustainability at Keele, a fatalistic

assumption about the agenda of the network actor (see Latour, 1996, 372-373), nor were they simply attempts to "do" alternative imaginaries of sustainability. Rather, based on my encounters, it seems that Food Services and CSBO are trying to control the *number* of actors in network of Keele Campus food who can actually act and speak on behalf of sustainable, local food, while simultaneously trying to limit their connections to one another.

Discussion and Theory: Social Arena Map

As other constructivist scholars argue, it would be fallacious to simply make assumptions about political machinations and capitalistic intentions of a single actor without considering the network around this actor. According to Rumpala (2009), tracing networks, particularly those of food, has become commonplace for many who become familiar with certain crises and inadequacies in the system: "In this perspective, it is not only a question of the individual familiarizing himself/herself with networks he or she is a part of, but also trying to gauge how to act in relation to the networks and thus organizing his/her life" (285). Particularly within a setting of higher education, individuals and groups are easily critical and have the knowledge and resources to trace the networks and locate the actors and the means by which they produce food for the campus. Limiting these networks limits the spaces for political action which would effectively disrupt the network and, thus, disrupt the established sustainability. As a result, actors like Food Services and CSBO seem to operate not as a result of a certain political agenda but out of responsibility for the network of which they have become a part. Nevertheless, much like the case for energy sustainability, attempts by actors to limit the networks tend to create more opportunities for social relations and, by extension, transformation of sustainability.

According to Timothy's interview, many of the Food Services annual surveys, which are intended to ascertain general satisfaction with campus food, indicate that the majority of

Keele community members are primarily concerned with price above all else and "uptake" in a number of their sustainability programs is often quite low. As a result of such sustainability imaginaries which tell of students and other Keele community members drawn to cheap convenience foods, actors pull together certain networks and establish certain boundaries of sustainability, dictating future knowledge and praxis. In other words, Food Services and Aramark are joined by multiple small-scale burger grills and deep fryers, providing easily transported food eaten on the move or on stiff metal chairs and plain tables, rather than restaurants equipped to wash and reuse plates for higher quality food. These establishments predicate specific transformations in sustainability praxis such as the Eco-Takeout program, which provides reusable containers, and the Lug-A-Mug program which discounts customers who bring their own coffee cups. Thus, as I have argued, the networks and their boundaries of what counts as sustainability are established through historical contingency and exigency rather than processes of forward "development." However, as Papadopoulos et al (2008) demonstrate, excess social relations accumulate on or near to the boundaries of a given set of prevailing knowledges and praxes, desiring escape and often leading to transformation (see also Levkoe, 2011; Levkoe and Wakefield, 2014; Goodman et al, 2012).

Tracing the Imaginaries of Keele Food and YUM: Positional Map

To form the final map, the positional map, we must look at the individual and group positions taken up to shift and move towards a transformation of sustainability. A number of examples exist of such positions taken up, in the form of imperceptible politics, by individuals involved in YUM.. These include vendors engaging in ongoing discussions of food security and nutrition concerns, a phenomenon completely unheard of in other areas of food consumption at Keele, as well as students contributing to, and presumably beginning to understand, their role in

supporting local food systems by engaging with those directly involved in every step of food production. The most notable example of the excess social relations necessary for the imperceptible politics to achieve transformation occurred at the second to last market of the year. Regenesis@York set up a table to encourage the community to sign a petition calling for the removal of Aramark from their position as manager of York food establishments and the appointment of a student co-op at the cafeteria in one of the campus colleges. The move was met with a great deal of support from students as well as faculty but a stern warning from Food Services and CSBO as, according to the administrator, it did not "engender trust or partnership" (Anon., personal communication, 4 April 2014). Both indirectly and directly, the market played a large role in making the invisible networks visible while giving space for imperceptible politics to move and thrive.

As with the energy project, it is important not to assume directionalities of influence by making erroneous claims that the food project results only from pushes and pulls between administrators and students for example, but instead to open up other positions and areas of influence to the data. Though a project of this scale does not allow for extensive investigation of these areas, it would be worthwhile to bring in discussions of actors like Student Community and Leadership Development (SCLD). This group, which operates under the Vice President Academic and Provost, is made up of many students as well as alumni and is responsible for providing students with club status. On several occasions when we wished to hold the YUM in one of the campus's high-traffic locations, SCLD informed us that this would impede other clubs from tabling in this area. SCLD are also, according to Regenesis, preventing YUM from booking this much more ideal space on a continuous basis due to these fairness concerns. David (8 February 2008) responds to this conflict by calling the club system one of the most significant

problems limiting campus sustainability projects due to the number of clubs recognized by administration: "The club system is the source of York's problems because it empowers people to waste time. If everyone is president, then it has no meaning. It's inflation." This rivalry reveals an alternative, but critically important conflict that raises the question: *why Regenesis and why not any other campus group? What makes their food sustainability count as legitimate?* This relationship, in addition to the rest of the network discussed, should be explored further by PEASE.

Discussion and Theory: Positional Map

It is important not to make the assumption that a student-run farmers' market is "more sustainable" than an administrative or corporate-run cafeteria, as making such a claim is of no interest to me at this point, but it seems as though having a relatively unregulated space, which resides precariously on the boundaries of what major actors consider "sustainable", attracts individuals to one another to question and discuss food in the biome. Many scholars in the social sciences, particularly focusing on political economy and localized food systems, have written on the effects of such spaces, particularly Feagan et al (2004) who argue that markets in Niagara have been instrumental in encouraging community members to become involved in the gradual relocalization of food systems (see also Svenfelt, 2010; Gilg and Battershill, 1998). However, I would argue that imaginaries of and desires for food democratization and liberation from corporate agri-business are often presented as equally teleological/ahistorical as aforementioned techno-scientific imaginaries and effectively fed into sustainable food projects in order to motivate the participation of certain socially marginalized individual and group actors (see Duram, 2010; Feagan, 2007). Regardless, it was important to all of the market organizers, from a

pedagogical perspective, to allow ensuing dialogue and reflexivity to guide the praxis of the market and determine what counts as sustainable food at the Keele Campus.

Final Thoughts

In the coming semesters, Food Services will take more direct control of the market and the vendors allowed therein while Regenesis@York negotiates a memorandum of agreement with CSBO in order to achieve vendor status rather than that of a student club. How these developments will impact the relationship of Food Services and Regenesis, as well as their positions within their respective networks and projects, remains to be seen.

Chapter 5: Concluding Remarks

With this study, I have presented a possible critique of one perspective regarding the representation and praxis of sustainability, supported by high-profile academics like Filho (2009) and practitioners at institutions like York, which characterizes sustainability, in historical terms, as a teleological process of "infusing" techno-scientific knowledge and moving towards an end goal. Though techno-scientific imaginaries are important contributors to knowing and doing sustainability, the desire to solely represent sustainability in such a way seems to derive from the desire to best answer the questions being asked of universities and similar institutions by, not only the United Nations, but multiple social and ecological publics which depend on these institutions for their continued well-being. These desires, however, neglect important questions regarding *whose* sustainability is getting done and *what counts* as sustainability in relation to multiple other ways of knowing and doing it. These questions are important for understanding what does *not* count as sustainability at a given moment in time and what conditions are necessary for effective activism and democratic change.

In order to answer these questions in relation to York University, I have attempted to accomplish three things: 1. "Flatten" the institution by limiting my inquiry to a contiguous zone, or biome, comprised of physically proximal actors, resources, and imaginaries involved in socio-ecological relationships; 2. Consider the sustainability praxes of these actors underpinned by sustainability imaginaries and not definitions, by tracing the narratives found in my qualitative interviews and reports from their meetings, as they function within boundaries of what counts as sustainability at a certain historical moment; 3. Map out the Keele biome and locate where social relations accumulate and what sorts of imaginaries drive them into networks to produce transformation through individual projects such as sustainable energy and food systems.

Though ecological frameworks such as the Planetary Boundaries concept provide a starting point for thinking about sustainability of local biomes in terms of its boundaries, there is a tendency among supporters to consider these boundaries as "naturally occurring" and scientifically axiomatic rather than highly contested and politicized limits of praxis. In other words, planetary boundaries are made without "us" and our representations. It is necessary to think about the scientific merely as one of multiple imaginaries on which actors base their praxis within a given network, rather than the sole determinant of understanding sustainability and the counterpart to political spheres in which policy is enacted. Nevertheless, the Planetary Boundaries framework provides a number of examples of epistemic locations from which I can trace connections to groups and projects at Keele.

At this point, I will say that my research, at its most basic, begins the process of mapping an important collective of sustainability actors with a corpus of data whose parts may be added to or modified by future researchers. Understanding the construction of sustainability by beginning at the level of the biome is not only valuable for the actors residing in the biome itself, but also for broader audiences of sustainability researchers and activists. With these core concepts in tow, I believe sustainability actors and praxis can potentially become more visible, and thereby, accessible for scholars and practitioners not just of the sciences, but of the humanities as well. I argue that my perspective may help sustainability activists and professionals understand further how sustainability transformation take place, for the sake of their own participation, and be able to interrogate the actors and imaginaries which determine what comes to count as sustainability at a given historical moment.

As I move forward with the PEASE project, I plan to investigate further four other sustainability projects, with their own sets of boundaries and praxes, already identified through

initial inquiry. The first is a more elaborate historicization of the concept of

Chlorofluorohydrocarbons and their effect on the Earth's stratosphere in relation to some of the

major architectural and infrastructural projects in the early-mid nineties at York's Keele Campus.

The second is the boundary of sustainable freshwater use in relation to Keele's recent water

regulation projects to ban bottled water and build alternative fountain infrastructure. A third

concept will explore the projects to maintain and develop Keele's woodlots and urban forestry in

relation to broader imaginaries of biodiversity. A fourth and final fruitful area of investigation

may be the so-called "man-made" planetary boundaries of chemical pollution and aerosol

loading which correspond with the YorkWise Zero Waste initiative and the implementation of

new transportation infrastructure.

Working with members of the PEASE project I plan to trace the mobilization of these

imaginaries through various actors and projects as, with all scientific inquiries and experiments,

data must be fed through appropriate models and not simply be "infused" into a situation. In this

way, a possible framework for understanding a particular sustainability in higher education

institutions can be developed for more widespread and meaningfully democratic activism to

protect our evermore precious Earth.

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Appendix A: Interview Questions*

1. Who do you feel are some of the main players in sustainability at York University? Why?

2. How has sustainability changed at York over the past few years? Do you see any significant trends?

3. What do you see as some of the main obstacles for sustainability at York?

4. What do you see as the primary role of your organization at York? Why?

5. What work is your organization best positioned to achieve? Why?

6. How do you envision your role in the organization and more generally in sustainability at York?

7. What are your organization's most successful projects? Why? What was achieved? How?

8. What are your organization's least successful projects? What was achieved? Why? How?

9. Does your work and the work of your organization connect with particular written policies at York? Which ones?

10. What changes at York would make the sustainability work at your organization easier in the future?

11. Who/what do you think is left out when sustainability decisions are being made?

*As these are general guiding/elicitation questions, more specific questions were asked depending on the context of the interview.

Appendix B: Interview Subjects

Aaron. Interviewed by Christopher Bentley. 28 March 2014.

David. Interviewed by Christopher Bentley. 8 February 2014.

Ellen. Interviewed by Ana Martinez and Steve Alsop. 25 February 2014.

Ethan. Interviewed by Christopher Bentley. 31 March 2014.

Matthew. Interviewed by Christopher Bentley. 22 January 2014.

Robert. Interviewed by Christopher Bentley. 3 April 2014.

Timothy. Interviewed by Christopher Bentley. 13 March 2014.

Appendix C: Glossary of Map Terms

AAPR: Academic and Administrative Program Review; a 2013/2014 initiative of the Vice President Academic and the Vice President Finance to determine the sustainability of individual programs at York.

Aramark: An external management and catering corporation that controls a number of York's food service operations.

CSBO: Campus Services and Business Operations; an entity under the Vice President Finance coordinating internal campus functions.

EMP: Energy Management Program; a 2006 initiative of CSBO and external firms to upgrade energy production and consumption facilities at the Keele campus.

FES: Faculty of Environmental Studies; one of the earliest and largest of its kind in Canada, develops research and teaching regarding environmental concerns.

Greenbelt Council: A group of researchers, bureaucrats, and planners working to help protect the greenbelt region for future economic and ecological services.

H.H. Angus: An external consulting firm who helped to assemble Keele's cogeneration facility in the late 1990s.

IRIS: Institute for Research and Innovation in Sustainability; a recently unchartered organized research unit supporting trans-disciplinary research for and between York and external faculty.

MOA: Memorandum of Agreement; a specific negotiation between Regenesis@York and CSBO to grant the former vendor status at York.

PSC: President's Sustainability Council; formed in 2008, a group of internal stakeholders coordinating and promoting sustainability practice in all areas of York.

Regenesis@York: A branch of a larger Toronto-based social justice and ecological sustainability group which advocates student and alumni participation in sustainability projects at York.

SCLD: Student Community and Leadership Development; an organization under the Vice President Academic and Provost which encourages and provides resources for student groups at York.

Sustainable Energy Initiative: A teaching and research program in the faculty of environmental studies which develops and promotes the use of renewable energy systems.

Sustainable Purchasing Coalition: A student group which engaged in multiple negotiations in the mid-2000s for a purchasing policy reflecting broader trends in socially and ecologically conscious consumption.

YCAS: York Centre for Applied Sustainability; the predecessor to IRIS, this organized research unit engaged in trans-disciplinary research as it applied to university policy and practice.

YUACRI: York University Advisory Committee on Responsible Investment; established in 2012 with the help of the PSC, this group applies pressure to the York University Board of Governors and helps to steer their decisions towards ethical and sustainable investments.

YUM: York University Market; established in 2013, by Regensis@York, Food Services, and manager Christopher Bentley, this ongoing farmer's market is the first of its kind at York University.