

Substantive and Procedural Equity in Environmental Planning:

A Case Example of Planning Thermal Treatment
Facilities for Municipal Solid Waste in the Province of
Ontario, Canada

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Nino Antadze

Abstract

Over the last few decades, thermal treatment of municipal solid waste (MSW) has been strongly opposed in North America. The reasons for public opposition are complex and could vary from community to community. Typically, public antagonism towards thermal treatment option is clearly revealed during the planning process of energy-from-waste facilities. Concepts such as NIMBY (Not In My Back Yard) have become synonymous with the siting of MSW thermal treatment facilities. Given the highly controversial nature of such projects, effective organization and conduct of the municipal planning process is of high importance. The literature suggests that public opposition can be fuelled by the perception of unfair outcome and unfair planning process. Therefore, the equity dimension of the planning process has gained importance.

This research explores the planning processes surrounding the development of thermal treatment plants for MSW in the province of Ontario, Canada by focusing on the equity dimension. The research aims to reveal the role and the nature of substantive equity, procedural equity, and cost and time efficiency, as well as the role of contextual elements in planning processes. Additionally, the research intends to provide recommendations on the effective incorporation of the equity dimension into the waste management planning processes.

Through a review of the literature on planning controversial facilities with a focus on waste disposal plants, it was revealed that the clear delineation of substantive and procedural equity as well as the identification of the main elements that fall under these notions are absent. Different studies present various elements of substantive and procedural equity, but they fall short in consolidation and analysis of linkages among the elements. In addition, it was revealed that the study of the contextual elements in relation to substantive and procedural equity has been quite limited.

Three research questions were identified that were informed by two assumptions derived from the consulted literature. To answer the research questions, three cases of planning thermal treatment plants in Ontario were investigated using qualitative research methods. The first case studied the Halton region thermal treatment project that was initiated in 2006 but was soon dropped without reaching the stage of full environmental assessment. The second case study focused on the Niagara-Hamilton thermal treatment project that was a joint effort between the city of Hamilton and the regional municipality of Niagara to find a local solution to the waste problem. An environmental assessment was conducted; however, before its completion the parties decided to stop the project and concentrate on other waste

management alternatives. Finally, the third case studied the Durham-York thermal treatment project that underwent a full environmental assessment process and is currently close to completion.

This research contributes towards expanding the conceptual discourse about the role of equity in planning waste disposal facilities with a particular emphasis on thermal treatment plants. More specifically, the thesis contributes towards delineating the notions of substantive and procedural equity and distinguishing their elements. It introduces the notion of context and explores those contextual elements that influence substantive and procedural equity during planning processes for thermal treatment facilities. As a result, the thesis develops a comprehensive analytical framework that consolidates the major elements that fall under the domains of substantive equity, procedural equity, and context that have previously been dispersed in the literature. In addition, the research establishes linkages among the elements within each domain and across domains. Based on the findings of the case studies, the notion of distributional equity is reconsidered.

Whereas the distributional aspect of the equity dimension is undoubtedly important, the thesis concludes that the substantive equity should go beyond the locational aspect of planning. The existence of cross-domain linkages and their importance and diversity confirms that the notion of equity should be studied and discussed in broader terms which acknowledge not only procedural or distributional issues, but also contextual elements and efficiency questions. The existing scholarship places particular emphasis on locational considerations (siting) and procedural issues; however, it fails to present a comprehensive and multidimensional view of equity and explain how this is embedded within the broader context. This research is an attempt to present equity with all its diversity and complexity and build a foundation upon which further work in this direction can be conducted.

More broadly, this research contributes to the better understanding of the perceptions and motivations behind public opposition towards infrastructure projects, and particularly waste management facilities. Given the complex nature of public opposition phenomenon, the research addresses the need to build an in-depth understanding of public motivations and perceptions that shape attitudes towards proposed projects.

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Dedication

In memory of my Father, Zurab Antadze

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List of Abbreviations

APEFW - Algonquin Power Energy-From-Waste
BANANA - Build Absolutely Nothing Anywhere Near Anyone
CAVE – Citizens Against Virtually Everything
CIELAP - Canadian Institute for Environmental Law and Policy
CPD – Control of Participation and Debate
DEFRA – The UK Department for Environment, Food and Rural Affairs
EA – Environmental Assessment
EC – European Commission
EEA – Environmental Assessment Act
EFW – Energy-From-Waste
EPA – Environmental Protection Act
EPR – Extended Producer Responsibility
ERT – Environmental Review Tribunal
FCM - Federation of Canadian Municipalities
FSC – Facility Siting Credo
GHG – Greenhouse Gas
GTA – Greater Toronto Area
GVRD – Greater Vancouver Regional District
IBA – Impact and Benefit Agreement
IC&C -Industrial, Commercial, and Institutional Waste
IFO – Industry Funding Organization
IWM – Integrated Waste Management
JWVG – Joint Waste Management Group
LLRW – Low-Level Radioactive Waste
LULU – Locally Unacceptable Land Uses
MACT – Maximum Achievable Control Technology
MBT – Mechanical Biological Treatment
MOE – Ministry of the Environment of Ontario
MSW – Municipal Solid Waste
NGO – Non-governmental Organization

NIABY – Not in Anyone’s Backyard
NIMBY – Not In My Backyard
NIMTOO – Not In My Term Of Office
NOPE – Not On Planet Earth
PACT – Public Acceptability of Controversial Technologies
PEI – Prince Edward Island
RFP – Request For Proposal
SBR – Superior Bargaining Resources
SCR – Selective Catalytic Reduction
SEA – Strategic Environmental Assessment
SI – Shaping Interests
SWARU - City of Hamilton’s Solid Waste Reduction Unit
ToR –Terms of Reference
UK – United Kingdom
WDA – Waste Diversion Act
3Rs – Reduce, Reuse, Recycle

Chapter 1

Introduction

Waste has always been “an inevitable product of society” (White et al., 1995). However, the current amounts and composition of produced solid waste are extraordinary. With the increase of consumption rates and the introduction of various new materials (such as plastics), safe treatment and disposal of the produced waste has become a challenging task, especially in developed countries where the rates of waste generation are several times higher than in countries with developing economies. In Canada, for example, the amounts of municipal solid wastes (MSW) increased by 13 percent over a four year period from 2000 to 2004, while the population only grew by 4 percent during the same period (David, 2007). Alarming, the per capita MSW generation rates in Canada are increasing steadily (Statistics Canada, 2009a).

Traditionally, the main disposal option for municipal solid waste in Canada is landfilling, although other waste management options are utilized, albeit on a smaller scale. While activities directed towards waste diversion from landfilling through recycling and composting practices are widespread, the actual recycling rates are not high. For example, municipalities of Ontario have put much effort into diverting waste from landfills, yet the average waste diversion rate of the residential waste in the Province in 2006 was only 37.8 percent (Gillespie, 2008). Consequently, large quantities of generated municipal solid waste need to be disposed at designated landfill sites. However, landfill capacity has been continuously shrinking over the last two decades. This, coupled with the extreme difficulty of siting new waste disposal facilities has largely contributed to the existing problem of limited disposal capacity.

Aside from landfilling and material recovery, current waste management theory and practice offer alternative waste management options. The widespread notion of a waste management hierarchy ranks different waste management options based on their environmental performance. In this listing, waste prevention, reduction, and reuse are the top priorities followed by material recovery (recycling and composting), energy recovery through thermal treatment of waste, and finally waste disposal at the sanitary landfill. The notion of Integrated Waste Management (IWM) suggests combinations of waste management options to achieve the most effective outcome for a specific locality. IWM is defined as a system that “combines waste streams, waste collection, treatment and disposal methods, with the objective of achieving environmental benefits, economic optimization and societal acceptability” (McDougal et al., 2001, p. 15). The IWM system recognizes that each waste management option plays a distinctive role, is an integral part of a whole, and contributes to the effective functioning of a system. Therefore, instead of focusing only on one particular waste management alternative and positioning it against others, IWM seeks to gain a synergetic

effect from the combination of various management options (White et al., 1995). In this context, thermal treatment of waste holds a place as a possible waste management alternative.

In spite of its potential, thermal treatment of municipal solid waste has been strongly opposed in North America over the last few decades. Although the public admits that there is a need for finding safe waste disposal methods, the willingness to accept potential risks associated with thermal treatment facilities remains low (Petts, 1994a). The reasons for public opposition are complex and could vary from community to community, yet the main factors for resistance are the perceptions of risk to health and the environment, excessive planning costs, construction and operation of the thermal treatment plants, and their potential to hinder waste recycling and prevention practices. Typically, public antagonism towards thermal treatment option is clearly revealed during the planning process of energy-from-waste facilities which elicits strong public opposition. Concepts such as NIMBYsm have become synonymous with the siting of MSW thermal treatment facilities. Given the highly controversial nature of such projects, effective organization and conduct of the municipal planning process is of high importance. The literature suggests that public opposition can be largely fuelled by the perception of unfair outcome and unfair planning process. Therefore, the equity dimension of the planning process gains importance (Wolsink & Devilee, 2009; Baxter et al., 1999; Gross, 2008; Dietz & Stern, 2008). This thesis investigates the notion of equity in broader terms that encompass not only procedural equity (fairness of the planning process) but also substantive equity (fairness of the outcome). The notion of equity is closely studied by developing and testing an analytical framework which consolidates the main elements of substantive and procedural equity and relevant contextual elements.

1.1 Research objective and research questions

The objective of the research is to reveal the role and the nature of substantive equity, procedural equity, and cost and time efficiency, as well as the role of context in planning processes for thermal treatment facilities for MSW in Ontario, Canada. A further aim is to propose recommendations on the effective incorporation of the equity dimension in the waste management planning process.

The following research questions will be investigated:

Research Question 1: What are the main elements of substantive and procedural equity for the planning process of thermal treatment plants?

Research Question 2: What are the contextual elements that affect the achievement of substantive and procedural equity in the planning process of thermal treatment plants?

Research Question 3: How can the equity dimension be effectively incorporated in the planning process of thermal treatment facilities?

The above research questions are informed by the following assumptions:

- Substantive and procedural equity influence public acceptance of thermal treatment facilities.
- It is necessary to make trade-offs between achieving a high degree of substantive and procedural equity, and cost and time efficiency.

1.2 Research scope and limitations

The research explores thermal treatment options including both conventional and advanced technologies. However, all three case studies present the planning processes as applied to mass-burn incinerators. Because of the limited number of relevant projects, it was not possible to explore the planning process for advanced thermal treatment plants, although a desk study has been conducted to gather background information about the planning process of Plasco gasification facility in Ottawa. The planning processes of mass-burn incinerators can be considered to be the most reflective of the various viewpoints existing in Canadian society regarding thermal treatment technologies. As such, this makes the conclusions of the thesis relevant to other thermal treatment technologies such as advanced thermal treatment options.

The geographic scope of the presented case studies is limited to Ontario. The choice of Ontario is mainly dictated by the existence of relevant and diverse cases of planning thermal treatment plants. The limited geographic scope of the cases could be considered a limitation of the study. Therefore, testing the developed analytical framework to cases located outside the province is one suggestion for further research (Section 6.2).

The thesis explores planning processes for thermal treatment plants designed for municipal solid waste. Thermal treatment plants designated for other types of waste are beyond the scope of this research.

The thesis does not aim to explore broader notions of democracy and environmental justice, although these concepts are often presented in the discussions surrounding substantive and procedural equity. The main focus of this thesis is *the planning process* for thermal treatment plants for municipal solid waste.

1.3 Terminology used in the thesis

Thermal treatment

This thesis employs *thermal treatment* as a broader notion which includes both conventional (incineration) and advanced thermal treatment technologies (pyrolysis, gasification) (See Section 2.1). The literature and waste management profession offer other alternative terms such as “thermal processing”, “waste-to-energy”, and “energy-from-waste” technologies. Whereas these terms are considered to be synonymous, “energy-from-waste” is largely employed in the North American context, whereas “waste-to-energy” is widely used in

European sources. The thesis employs the term *thermal treatment* because of its comparatively wider use in the relevant academic literature. In addition, the use of a broader term such as *thermal treatment* is dictated by the fact that due to their more common occurrence, incinerators are often associated with the energy recovery option in general while ignoring the existence of other thermal treatment technologies such as gasification or pyrolysis. Incineration often has a strong burning connotation rather than being associated with energy recovery. This may be due to its historical legacy, as old-generation incinerators were designed solely to burn waste. *Thermal treatment* unifies all types of technologies whether with or without energy recovery.

Municipal solid waste

The thesis adopts the definition of *Municipal Solid Waste* offered by Regulation 347 under the Ontario Environmental Protection Act. According to this Regulation, “municipal waste” means:

- (a) any waste, whether or not it is owned, controlled or managed by a municipality, except,
 - (i) hazardous waste,
 - (ii) liquid industrial waste, or
 - (iii) gaseous waste, and
- (b) solid fuel, whether or not it is waste, that is derived in whole or in part from the waste included in clause (a) (EPA Regulation 347, Definitions)

Planning Process

Planning process indicates the period beginning with the initiation of the undertaking until the completion of the legally required procedures to receive approval for the project implementation.

1.4 Thesis outline

The thesis is organized into six main chapters. Chapter 1 introduces the problem addressed in this thesis and presents the research objective and research questions. Subsequent sections describe the scope and limitations of the research, define the key terms, and explain the structure of the thesis.

Chapter 2 offers a thorough overview of the field of study and locates the research within the existing body of knowledge. Section 2.1 opens by discussing existing thermal treatment technologies for municipal solid waste, including their effects on human health and the environment, economic considerations, implications for 3R (reduction, reuse, recycling) and prevention strategies, and prospects of energy recovery. Further, the chapter introduces the concept of Integrated Waste Management (IWM) and discusses thermal treatment option as one component of the IWM system. Section 2.2 describes historical developments of thermal treatment industry in Canada and briefly presents the plants currently operating throughout the country. Further, Section 2.3 presents the legal framework within which planning processes for thermal treatment plants in Ontario unfold. This section offers a brief description of the relevant legal acts and procedures. Section 2.4 draws from the vast literature of public opposition towards unwanted land uses and

presents a broad discussion on Not-In-My-Back-Yard phenomenon and the notion of equity. Section 2.5 outlines the main gaps identified in the literature. Lastly, Section 2.6 presents an analytical framework employed in this research. The analytical framework is developed based on the conducted literature review surrounding the notion of equity and includes four main domains – substantive equity, procedural equity, efficiency, and contextual elements. More specific themes and elements falling under each of these domains are described in the framework.

Chapter 3 presents the research methodology used in the thesis. The chapter begins with the discussion about the chosen scientific research paradigm – critical realism. Ontological, epistemological, and methodological considerations of critical realism are explained. Subsequent sections describe employed research methods such as case study research, interviews, and document analysis. The final section of the chapter is dedicated to discussing the validity of findings.

Chapter 4 presents conducted case studies. The description of each case consists of two major parts: a description of the chronological order of the planning process and an analysis of findings. The analytical part of each case is built according to the analytical framework presented in Chapter 2.

Chapter 5 presents the consolidated analysis of the findings and links them to the studied literature. Further, the chapter discusses underlying power dynamics of public participation processes and briefly analyses the role of power in the presented framework. In Sections 5.6 and 5.7 the implications of the findings for the planning theory and Environmental Assessment process are discussed. The last section of this chapter offers the reflections upon some of the points that are not central to the objective of the current thesis, but are considered important to be raised and acknowledged.

Chapter 6 discusses the main findings of this research. Section 6.1 explains the contributions made to the existing knowledge and offers recommendations to policy-makers and planners about effective incorporation of the equity dimension into the planning process of waste management facilities. Lastly, Section 6.2 makes suggestions for further research.

Chapter 2

Setting the background – Literature review

This chapter positions the current research within the broader field of study by presenting extensive literature review and identifying existing knowledge gaps. The chapter opens with the introduction of thermal treatment as one of the waste management options. Section 2.1 discusses existing thermal treatment technologies, positive and negative aspects of this waste management option, and its role within the broader Integrated Waste Management System. Section 2.2 reviews the history and the present developments of thermal treatment option in Canada. Section 2.3 describes the legislative framework pertinent to planning thermal treatment plants in Ontario. Section 2.4 presents a discussion regarding the public opposition towards locally unwanted land uses. Namely, the NIMBY phenomenon and the notion of equity are discussed and analyzed. Next, Section 2.5 outlines the identified research gaps and Section 2.6 presents an analytical framework employed in this thesis.

2.1 Thermal treatment of municipal solid waste

2.1.1 Thermal treatment technologies

Thermal treatment technologies are often classified into two larger groups of conventional and advanced technologies. Conventional or what is also known as “proven technologies”, include mass burn, rotary kiln, starved air, and fluidized bed incinerators. Pyrolysis, gasification and thermal plasma technologies are labelled as advanced or emerging thermal treatment options (FCM, 2004; DEFRA, 2007).

The above classification is grounded on the historical developments of different types of thermal treatment technologies. The conventional incinerators, namely, mass burn facilities, have been used for more than a century to treat municipal solid waste (MSW). In contrast, pyrolysis, gasification, and thermal plasma technologies were mostly used to treat hazardous waste, wood wastes, and industrial sludge, and have been recently applied to the MSW. Therefore, advanced thermal technologies have not established their position yet as reliable and effective treatment options applicable to MSW (FCM, 2004).

2.1.2 Conventional thermal treatment technologies

Incineration implies waste combustion process in an excess of oxygen (Lemann, 2008; Hulgaard & Vehlow, 2011). Developed in the late 19th century, the first incineration plant was aimed at reducing the volume of wastes. Presently, incinerators represent sophisticated technological facilities that not only treat waste, but also produce energy (Hulgaard & Vehlow, 2011).

Although incineration facilities can be classified according to a few different parameters, such as their capacity, the system employed, and the nature of waste to be combusted, the most wide-spread classification is that between the mass burn incineration and other types. Mass burn incineration implies a large-scale process (typical throughput is in a range of 10-50 tonnes/hour) of complete combustion or thermal oxidation of waste. The other types of incineration are characterized with significantly smaller scale of operation (throughput of 1-2 tonnes/hour) and include, among others, fluidized bed, starved air, and rotary kiln (Williams, 2005). The next section focuses on the most common type of MSW incinerator – a mass-burn incinerator with the moving grate combustion zone. However, fluidized bed, starved air, and rotary kiln incinerators are also briefly described.

2.1.2.1 Mass burn incinerator

Since a mass burn incinerator can handle a diverse waste stream in terms of composition and particle size, waste does not need to be pre-treated before its combustion (e.g. shredded and dried) (Williams, 2005; Rand, Haukohl & Marxen, 2000). However, certain types of pre-treatment operations may increase the combustion efficiency. For example, the removal of glass and metal for further recycling, as well as the separation of wet waste (such as food and garden waste), increases the net available calorific value of the waste stream and decreases the emission levels of heavy metals through fly and bottom ash. On the other hand, separation of paper, cardboard, and plastic reduces the energy content of the waste stock (Williams, 2005).

The design of the emission control system is dependent on the composition of the waste feedstock, applied treatment technology, and the existing legal regulations (Rand et al., 2000). However, a typical emission control system is comprised of a variety of flue gas treatment stages: Firstly, the particulate matter is collected through the cyclones, fabric filters, and electrostatic precipitator. Next, the acid gases are removed by the wet, dry or wet-dry scrubbers. Afterwards, the dioxides and furans, as well as the heavy metals and organic micro-pollutants are treated with the fine filters and activated carbon and lastly, Nitrogen oxides are controlled by selective catalytic reduction (SCR) process in the presence of added ammonia (Williams, 2005).

Aside from producing flue gases, incinerators also result in the production of wastewater and ash residue. Although wastewater is generated in comparatively smaller quantities, it may be highly acidic and contain heavy metals. Such wastewater is a product of flue gas cleaning system and needs to be treated before being discharged. The ash residues are comprised of fly and bottom ash. The latter constitutes a major part of the produced ash residues and consists of slag, glass, ceramics, other inert waste, and uncombusted organic matter. The bottom ash can also contain metals with the low level of volatility such as iron and nickel. While the bottom ash is widely used as a secondary material for construction and road building, the fly ash is often labelled as hazardous because of its composition and is disposed at the hazardous waste landfills (Williams, 2005).

2.1.2.2 Fluidized bed incinerator

Fluidized bed incinerators are used for various types of wastes including municipal solid waste, hazardous waste, sewage sludge, liquid and gaseous waste. Fluidized bed incinerators allow longer residence times for the waste stock, that results in the increased combustion rate and reduced amounts of organic pollutants (Williams, 2005; Biffaward Programme on Sustainable Resource Use, 2003).

Fluidized beds represent a bed of hot sand particles that are heated by the hot air or gas prior to waste introduction (usually up to 850°C). The primary combustion air is injected from below the bed and the sand particles get fluidized according to the air flow. Waste is fed into the hot sand bed and undergoes drying, devolatilisation, ignition and combustion stages. After waste is combusted produced flue gases move up to the combustion chamber where additional air is introduced (Williams, 2005).

In order to be treated in the fluidized bed incinerator, municipal solid waste needs to be pre-processed to meet set requirements of size, ash content, and calorific value. The need of waste pre-treatment is considered to be the main disadvantage of the fluidized bed incinerators (Hulgaard & Vehlow, 2011). On the other hand, this type of incinerator has high thermal efficiency of up to 90 percent and requires comparatively lower capital and operational expenses (Williams, 2005; Rand et al., 2000).

2.1.2.3 Starved air incinerator

Starved air incinerators have a two stage combustion process – pyrolytic stage and combustion stage. Two-stage incineration results in the better controlled combustion process with the decreased amounts of air pollutants such as volatile organic pollutants, carbon monoxide, dioxins and furans, and heavy metals (Williams, 2005).

2.1.2.4 Rotary kiln incinerator

Similar to starved air incinerators, rotary kiln facilities also have two-stage combustion process. However, instead of the pyrolytic first stage, rotary kiln incinerators employ oxidized combustion process. The primary combustion chamber represents “an inclined cylinder lined with ceramic material which rotates on rollers” (Williams, 2005, p. 314). The residence time of waste in the primary chamber may exceed 30 minutes. Afterwards, flue gasses are transported into the secondary chamber (also referred as after-burning chamber) where they are completely burned out in the presence of oxygen (Williams, 2005; Rand et al., 2000).

Rotary kilns are known to be especially effective for treating hazardous waste, as they provide both the long residence time and high combustion temperatures (Williams, 2005; Hulgaard & Vehlow, 2011). Rotary kiln incinerators can handle large volumes of heterogeneous waste without undertaking any pre-treatment, such as sorting or shredding. This type of incinerator is characterized with the energy efficiency of about 80 percent.

The downside of the rotary kiln incinerator can be considered its limited capacity (about 480 tonnes/day) and relatively high capital and operational costs (Rand et al., 2000; Hulgaard & Vehlow, 2011).

2.1.3 Advanced thermal treatment technologies

2.1.3.1 Gasification and Pyrolysis

Under the restricted presence of oxygen, gasification process breaks down organic waste into synthetic gas (syngas) and ash. The syngas is comprised of the carbon monoxide, hydrogen, and methane, while the ash is mainly comprised of the non-combustible materials and, to a lower extent, carbon. The process takes place at the high temperature (around 800 -1400°C) and is of exothermic nature (although some amount of energy can be introduced to initiate and maintain the process). Compared to natural gas, syngas possesses a much lower calorific value (Young, 2010; BIOCAP Canada, 2008; DEFRA, 2007).

In contrast to the gasification process, pyrolysis takes place in the absence of oxygen and breaks down organic waste under the relatively lower temperatures of about 400-600°C. Pyrolysis results in syngas, char (combination of non-combustible materials and carbon) and bio-oil. Bio-oil is produced through condensing the condensable part of the generated gases (Williams, 2005). Derived oil is shown to have a complex chemical composition and can be used as a fuel because of its higher energy density compared to the waste. Produced char can also be used as a solid fuel. The non-condensable gas can be utilised for the provision of needed energy to a pyrolysis facility (Williams, 2005).

Aside from the pyrolysis process described above, a more advanced method of “fast pyrolysis” has also been practiced. In case of fast pyrolysis, the biomass decomposes more quickly resulting mostly in vapours, aerosols, and some charcoal. After the condensation, a dark homogenous liquid with about the half of the heating value of the conventional fuel oils is formed (Crocker, 2010).

As Williams (2005) notes, the main difference between incineration, gasification, and pyrolysis is the amount of oxygen present during the thermal treatment process. If the waste is fully oxidised during incineration, gasification allows presence of a limited amount of oxygen, while pyrolysis is the fully oxygen-free option. These three thermal treatment technologies result in different types of products.

Unlike gasification, pyrolysis is an endothermic process that requires energy input (Young, 2010). Consequently, the ability to recover materials (such as metals and organic chemicals) is considered to be the primary advantage of pyrolysis, leaving energy recovery as a secondary benefit (Biffaward Programme on Sustainable Resource Use, 2003).

2.1.3.2 Thermal plasma technologies

Aside from gasification and pyrolysis, thermal plasma technology is considered to be more advanced waste treatment alternative compared to the conventional incineration (Huang & Tang, 2007). Before being applied to municipal solid waste, thermal plasma technology has been successfully used to treat hazardous waste (Heberlein and Murphy, 2008). During thermal plasma process, gas is converted into plasma by adding sufficient energy. Along with the solid, liquid, and gas state, plasma is believed to be the fourth state of matter. While being electronically neutral, plasma consists of mixture of electrons, ions, and neutral particles (Huang & Tang, 2007; Gomez et al., 2009). As Gomez et al. (2009) explain, “plasma technology involves the creation of a sustained electrical arc by the passage of electric current through a gas in a process referred to as electrical breakdown” (p. 615).

2.1.4 Positive and negative aspects of thermal treatment technologies

Studies present different standpoints about positive and negative aspects of thermal treatment technologies that can be clustered under four main topics: implications on human health and the environment, implications on cost for construction and operation of incinerators, incompatibility with 3R (Reduce, Reuse, Recycle) and waste prevention strategy, and energy recovery through incineration. The discussion of thermal treatment is often closely tied with the issues relevant to landfilling as these two options are often considered to be competitive rather than complementary. Therefore, the following discussion reflects this focus of the discourse, although acknowledges the existence of other waste management options such as composting and anaerobic digestion for organic waste and recycling for the recyclable fractions.

2.1.4.1 Positive and negative aspects of incineration

2.1.4.1.1 Implications on human health and the environment

One of the major arguments against waste incineration is its negative impact on human health and the environment. Environmental pollution caused by incineration and the consequent health implications are related to air emissions, production of fly ash and bottom ash. Air emissions from waste incineration may contain heavy metals, gaseous pollutants (nitrogen oxide sulphur oxide, hydrogen chloride, carbon monoxide), and toxic trace organic compounds such as dioxins and furans. During the combustion process, heavy metals present in the waste stream are oxidized and acquire increased mobility and can be more readily transported and absorbed by living organisms. In addition, dioxins and furans, that are the by-products of

the combustion process, have been directly linked to the severe health implications (Hulgaard & Vehlow, 2011; National Research Council, 2000).

Although contemporary incineration technologies are much more advanced compared to those used 20-30 years ago, their negative impact on the environment and human health is still a sharp issue. However, scholars consider different mitigation measures that can decrease significantly such an impact. Denison et al. (1994) highlight the importance of separating hazardous waste from the feedstock. This measure will ensure that heavy metals and other toxic substances are not present during the incineration process, and thus, will not be put back into the environment (e.g. air emission, metal-containing particles in fly ash). However, during thermal processing some toxics can be generated from non-toxic waste materials, such as dioxins and furans that are the by-products of the combustion process (Baukal, 2010; Denison & Ruston, 1990). Therefore, it is of primary importance to ensure constant monitoring and control of the emissions (Farmer, 2002). Continuing this topic, Solway & Haight (1991) note, that incinerators are better controlled and monitored compared to landfills. In addition, in the case of any serious problem, incinerator can be immediately shut down, while landfills are not characterized with such a level of flexibility (Solway & Haight, 1991).

According to Knox (2005) incineration emits much less greenhouse gases compared to landfilling. Mohareb et al. (2008) present the results of the modelling exercise conducted to measure Greenhouse Gas (GHG) emissions from various waste management scenarios¹ in the City of Ottawa, Canada. The authors conclude that the greatest impact on reducing GHG emissions would be gained through increased recycling (up to 50 percent), followed by waste incineration with energy recovery. On the contrary, waste incineration has the highest potential to reduce energy consumption, while recycling ranks the second in this category.

2.1.4.1.2 Implications on cost for construction and operation of incinerator

Waste incineration is considered to be the most expensive option among the other waste management alternatives because of its high capital and operation costs (Porter, 2002; Denison & Ruston, 1990; National Research Council, 2000). In addition, large scale incineration plants are characterised by the economy of scale effect (Porter, 2002). As Castillo-Castillo et al. (2009) observe, the capital costs per tonne of waste may decrease by up to 25 percent in case plant capacity is doubled and the electricity generation efficiency is increased². However, some doubt whether high cost is a strong enough argument against incineration.

¹The studied scenarios include: 1) Landfill all waste, 2) Current case, 3) Upgrade landfill gas capture system, 4) Increase diversion of manufactured goods by 50%, 5) Diversion food waste (30% capture rate), with organics diverted sent for composting 6) Diversion of food waste (30% capture rate), with organics diverted sent to anaerobic digestion, 7) Source reduction of manufactured goods (by 10%), 8) Incineration of waste.

²However, the existence of the large-scale thermal treatment facility results in the intensification of traffic flow and increase of distances for waste transportation (Castillo-Castillo et al., 2009).

Consideration of the incineration costs should be undertaken in comparison with the other waste management alternatives. Consequently, costs should not be seen as an absolute value, but rather as a relative variable.

The costs of a particular waste management option do not depend solely on its financial implications, but also on the relevant environmental and social costs. The latter costs are referred to as *external costs* and become internalised during the cost-benefit analysis. In cost-benefit analysis, “the benefits of some proposed action are estimated and compared with the total costs that society would bear if that action were undertaken” (Field & Olewiler, 1994, p. 18-19). Consequently, the cost of thermal treatment option is not framed only by its internal or financial costs (e.g. operational costs), but also by the external costs³ (e.g. air pollution) and external benefits (e.g. energy recovery⁴) (EC, 2000).

While comparing costs, one might also calculate external costs that are not usually internalized in cost-benefit analysis, thus comparing different waste management options based on their life-cycle impact. Among other issues, external costs may include ethical considerations, e.g. when waste is shipped from one country to another, thus, undermining the principle of proximity⁵. The latter causes the increase of transportation distance for waste disposal and consequent rise of vehicle emissions. In addition, communities start to avoid “the transfer of externalities” thus, turning towards the community-scale treatment options for municipal solid waste (Castillo-Castillo et al., 2009). The other externalities to be considered can be the contingent future environmental liabilities from disposal of hazardous fly ash, as well as, possible decrease of property values around the waste management facility, dust, noise, and pollution that may result from the facility operation (Porter, 2002; National Research Council, 2000). When it comes to landfilling, the externalities may still occur even after the landfill is closed (e.g. pollution of groundwater) and may add up to the internalized costs of maintaining the old landfill.

Among the revenue sources for thermal treatment facilities, Fichtner (2008) lists tipping fees, electricity and steam sales, recycled metals from ash or upfront processing, and CO₂ credits in the future perspective. In rare cases, energy sales from the large-scale facility may cover up to 90 percent of total costs, however, mostly they offset only about 30-45 percent (Morawski, 2007; Fichtner, 2008; Rand et al., 2000). For example, energy sales of Algonquin Power Energy-From-Waste facility in Brampton Ontario cover one third of the expenses, whereas the other two thirds are paid off from the tipping fees (Smith, 2006). The revenue from energy sales

³As Field & Olewiler (1994, p. 69) explain, an external cost is “a true cost to society”, but is not present in profit-and-loss statement. Consequently, such costs are not taken into account while making decisions. On the other hand, an external benefit “accrues to somebody who is outside, external, to the decision about consuming or using the good or resource that causes the externality” (Field & Olewiler, 1994, p. 75).

⁴Aside from being an external benefit, energy recovery is also an internal benefit as its value affects the operational costs of the thermal treatment facility (EC, 2000).

⁵ Proximity principle implies that waste should be “disposed of as closely as possible to where it was produced” (EC, 1999, p. 10).

is dependent on the existence of the market for excess heat and electricity. The lack of a well-developed district heating system in Ontario and siting issues for thermal treatment plants close to urban or industrial areas, where recovered heat could be utilized, hinder large-scale heat sales. The amount of revenues from energy sales may also be linked to the recognition of MSW as a renewable source of energy. Smith (2006) argues that if the energy produced by the Energy-From-Waste (EFW) facilities is considered as green, it would be priced higher. Fichtner (2008) notes that once paid off, thermal treatment facilities can become revenue generators.

2.1.4.1.3 Incompatibility with the 3Rs (reduction, reuse, recycling) and waste prevention strategy

Incompatibility with the 3Rs and waste prevention strategy can be considered as one of the sharpest arguments against introducing large-scale incineration. As Denison & Ruston (1990) state, “commitments to large-scale incineration may work as long-term commitments *not* to recycle, even as recycling markets grow” (p.14). Certainly, the existence of incineration capacity may hinder introduction of logistically and institutionally more complex system of waste separation for organic and recyclable fractions of waste (Hill, 2010; Denison et al., 1994). In addition, thermal treatment facilities are capital intensive initiatives requiring significant amounts of financial investments that are expected to be paid off during the course of incinerator operation.

It is obvious that even the most successful recycling programmes are not able to divert all the recyclables from the waste stream. Despite their critical rhetoric about the prospects of large-scale incineration to hinder recycling practices, Denison & Ruston (1990) admit that after the maximum recycling, significant amounts of waste will be left for further landfilling or thermal treatment. However, Porter (2002) offers a contrasting view by claiming that extensive recycling may significantly decrease the waste stream for thermal treatment, thus making the latter not economically viable.

Incineration can still be considered as a possible waste disposal option, but not the only one. One waste management option should not prevent other alternatives (especially those being higher on the waste hierarchy) to be implemented. Some argue that incineration and recycling should not be considered as rivals, but rather as different components of a larger setting - Integrated Waste Management. Incineration is more clearly seen as a competitor of landfilling (Bridges, Bridges & Potter, 2000; Eshet, Ayalon and Shechter, 2005; Mendes, Aramaki & Hanaki, 2004; Knox, 2000). As McDougall et al. (2001) note, Integrated Waste Management (IWM) is a holistic approach where every waste management option has its role to play. Since there is no universally “the best” system to pursue, IWM enables one to design a system that is best suited for the given circumstances, such as geographical location, waste composition, existing management capacity (McDougall et al., 2001).

In terms of waste prevention, many argue that incineration may hinder it to some extent as the constant flow of waste is necessary for the smooth operation of the plant, thus reducing the incentive to produce less waste. On the other hand, there are stronger forces present that influence waste reduction such as our lifestyles, consumption and production practices.

2.1.4.1.4 Energy recovery through incineration

The composition and moisture content of waste are highly important factors for energy recovery from waste combustion. In addition, the collection methods as well as the pre-treatment of waste play an important role in increasing energy recovery efficiency (FCM, 2004).

According to the MOE (2004, p. 4), paper and food waste constitute two significant waste fractions in the overall residential waste stream of Ontario. The “other” category unifies, among others, such items as ceramics, textile, leather, rubber, batteries, ashes (See Figure 1). The amount of yard waste may vary seasonally.

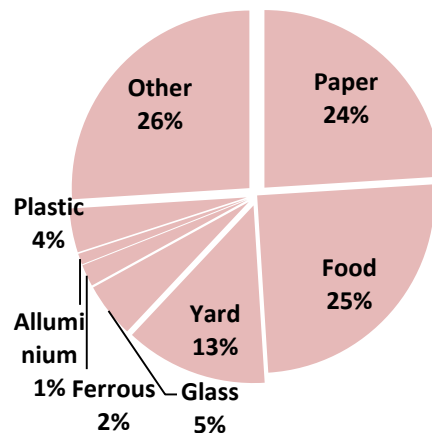


Figure 1 Composition of the residential waste in Ontario

Source: Ministry of the Environment of Ontario (MOE), 2004, p.4.

According to the FCM (2004) untreated municipal solid waste possesses the energy value of about 12 gigajoules/tonne. Consequently, electricity derived from the thermal treatment of five tonnes of MSW can provide an annual power supply of a “typical Canadian home” (p. 229).

Even while burning waste of high calorific value, the energy produced from incineration is still more expensive than energy generated through other sources. In addition, some note that in terms of energy production, incineration is a poor choice and that is why its main purpose is waste disposal (Rand et al., 2000).

The other important question is whether recycling provides a more effective way of energy recovery than thermal treatment. Here the answer may vary depending on the recyclable material. For example, existing literature concludes that in the case of aluminium, recycling will save more energy. However, in the case of plastics, the answer may be different (Villanueva & Wenzel, 2007; Lea, 1996; Björklund & Finnveden, 2007; Morris, 1996).

2.1.4.2 Positive and negative aspects of gasification and pyrolysis

Gasification and pyrolysis technologies can handle only homogeneous, carbon-containing waste (plastics, paper, and organic materials). Moreover, feedstock must be dried and reduced in size (Belgiorno, De Feo, Della Rocca & Napoli, 2003). As Ray & Thorpe (2007) explain, reduction of the waste size is needed “to produce a feed of improved bulk density to facilitate ease of feeding” (p.7). This need for size reduction, the inability of gasification and pyrolysis to handle mixed waste and the need for waste pre-treatment (e.g. to remove metals and glass, shred waste into smaller particle sizes) is considered as one of the shortcomings of the advanced thermal treatment options (compared to conventional incineration, that can handle mixed waste without any prior treatment) (Baggio et al., 2008; Ray & Thorpe, 2007; Ryu et al., 2007).

Ray & Thorpe (2007) and Ryu et al. (2007) claim that the syngas produced after gasification contains many impurities and therefore, requires clean-up. In addition, Ray & Thorpe (2007) consider the need to purify condensed products produced through pyrolysis as one of the downsides of this thermal treatment alternative. According to Khoet al. (2006) pyrolysis and gasification produce less air emissions due to the limited use of oxygen. Baggio et al., (2008) also highlight the ability of pyrolysis process to reduce polluting emissions compared to the mass-burn incinerators. On the other hand, Brunner (2002) claims that the commercial attempts to develop pyrolysis technology were accompanied with severe technical problems, including issues related to the clean-up of the generated gases.

Many note that pyrolysis and gasification produce storable and useful products (Baggio et al., 2008; Williams, 2005; Ryu et al., 2007). In contrast with the conventional incineration that only generates energy, pyrolysis and gasification produce syngas, oil, and char used as fuel or feedstock.

The other advantage of pyrolysis and gasification technologies, compared to conventional incineration, is their claimed high flexibility. Pyrolysis and gasification plants are of a modular design and thus, comprise separate units. Depending on the waste amount, units can be taken away or added to the plant (Baggio et al., 2008; Juniper Consultancy Services Limited, 2007, Castillo-Castillo et al., 2009). However, the technical features of the advanced thermal treatment plants have not been substantiated at large commercial scale (Brunner, 2002).

2.1.4.3 Positive and negative aspects of thermal plasma technology

Thermal plasma technology is characterised by high temperature, high intensity, non-ionising radiation, and high-energy density (Gomez et al., 2009). Therefore, Heberlein & Murphy (2008) name the ability of thermal plasma technology “to vaporize anything and destroy any chemical bonds” as one of its main advantages.

Waste treatment by thermal plasma technology results in the inert ash, sulphur and residues containing heavy metals (BIOCAP Canada, 2008). Thermal plasma technology destroys organic waste and forms combustible gas and solid residue that may have different composition depending on the feedstock waste (Huang & Tang, 2007). Huang & Tang (2007) conclude that thermal plasma technology produces only two product streams (gas and solid residue) that are “predictable, harmless and acceptable for public health and environment” (p. 1336).

According to Huang & Tang (2007), thermal plasma technology is the most expensive alternative to undertake. The high cost associated with thermal plasma technologies is the result of the extensive use of electricity. On the other hand, in case of thermal plasma technology, the flow rate of emitted gases is much lower, hence, decreasing the emission treatment costs (Heberlein & Murphy; 2008, Gomez et al., 2009).

2.1.5 Thermal treatment as a component of the Integrated Waste Management System

According to Seadon (2006) IWM is a framework that can be applied to improve the existing waste management system or design a new one. As McDougall et al. (2001) explain waste management consists of the “many closely related processes, integrated together” (p.13). One management method cannot manage waste sustainably. Combination of different waste management options is needed to build an environmentally and economically sustainable waste management system that deals with the whole waste management stream and not with its particular components.

McDougall et al. (2001) define IWM systems as those that “combine waste streams, waste collection, treatment and disposal methods, with the objective of achieving environmental benefits, economic optimization and societal acceptability. This will lead to a practical waste management system for any specific region” (p. 15).

WM treats the waste management sector as the union of interrelated and interdependent elements. In other words, IWM is a system approach. As Seadon (2006) puts it, in the system approach the problems have multidimensional and multidisciplinary nature and, thus, their solutions must also reflect this complexity. In addition, system approach is oriented towards long-term perspective.

Continuing the topic, Clift et al. (2000) depart from the idea of “simple hierarchy” of waste management options and stress the need for life-cycle approach (p. 279-280). Thus, through comparison of different

alternatives, priority should be given to the waste management option that is most appropriate in terms of environmental considerations for the given time and place.

According to Seadon (2006), management of different streams in isolation from each other leads to the increasing amounts of waste and does not address effectively the problem. As a response to the above-mentioned practice, a modern approach of integrated waste management has emerged. IWM recognises that waste-related issues are inter-related and thus, should be dealt in an integrative manner.

Hostovsky (2005) refers to the integrated waste management as the holistic system that unifies reduction, reuse, recycling, composting, incineration practices and, similar to the viewpoint of McDougall et al. (2001), is oriented to achieve economy of scale by operating on the regional level. Williams (1994) emphasises that the IWM system shall be holistic where each part “must have its own purpose and work in tandem with all the other pieces like a finely crafted, highly efficient piece of machinery” (p. 2.11)

Seadon (2006) presents four main parameters of Integrated Waste Management:

1. Integration within a single medium (solid, aqueous or atmospheric wastes) by considering alternative waste management options presented in the waste management hierarchy. The integrated approach implies that these options are complementary to each other and not antagonistic (Solway and Haight, 1991).
2. Multi-media integration (solid, aqueous, and atmospheric waste) means that IWM views waste across all the media rather than concentrating only on a particular one. Once the waste is transferred from one media to another, the consequences must be assessed. For example, the shift of waste from landfilling to incineration cannot be viewed as the best solution any more.
3. The integrated approach to waste management stresses the necessity of incorporating all the interested stakeholders and agents that are involved in the waste management system. The actors include government bodies (local and national), businesses (private sector) and the communities (public). In order to achieve success, it is necessary to ensure the an active cooperation among the agents (Seadon, 2006).
4. The IWM approach can be implemented through a set of instruments that Seadon (2006) categorizes as being regulatory, economic, voluntary, and informational. He also stresses that hardly ever does one single instrument do the whole work. Usually, it is more effective to combine different types of instruments.

IWM takes a holistic view and does not consider only a single waste stream, a single waste management option or a single media. It takes into consideration all the waste management options, all the media, all the main agents and instruments that can be employed. The core idea is to integrate and combine various aspects and factors in order to come up with the best possible solution. Thus, understanding the whole picture and all its elements will lead towards constructing an integrated system.

From the perspective of the IWM, thermal treatment is one of the management options for municipal solid waste. IWM does not imply ignorance of other alternatives, but rather, depending on the local circumstances, takes its own niche within the waste management system. As discussed above, the similar sentiments are echoed by those arguing that recycling and thermal treatment are complementary and not mutually exclusive and the main choice to be made is between landfilling and thermal treatment. On the other hand, critics argue that instead of the peaceful coexistence of different alternatives that IWM dictates, the waste management practices will be largely influenced by the existence of the large-scale thermal treatment facility.

The above discussion aimed to illustrate that thermal treatment technologies consist of different technical solutions and not, as generally regarded, solely waste incineration. In addition, the previous sections show that thermal treatment of waste is a highly controversial issue. This controversy concerns possible negative impact that thermal treatment plants may have on human health and the environment, their ability to prevent 3R and waste prevention activities, connections to the global climate change process, and their potential to generate energy. Lastly, this discussion aimed to situate thermal treatment of waste within the Integrated Waste Management framework and view it as one of the management options existing within the larger waste management system.

As the main focus of this thesis is the public review process of new thermal treatment projects, the above represents a general background that helps to view the issue in its multifaceted context. The next few sections will narrow down the scope of the discussion to present historical and legal contexts directly pertinent to the planning processes of thermal treatment plants in Ontario, Canada.

2.2 Thermal treatment of MSW in Canada

2.2.1 Thermal treatment of MSW in Ontario

The first incinerator built in the Greater Golden Horseshoe⁶ area dates back to 1891. The Eastern Avenue Crematory processed municipal solid waste from Toronto; however, after a year it burnt down and ceased to operate. The next large-scale incinerator – the Don Destructor – was constructed in 1917, thus marking the

⁶ According to Ontario Regulation 416/05 on Growth Plan Areas under the Places to Grow Act 2005, Greater Golden Horseshoe growth plan area is comprised of the following geographic areas: Brant, Dufferin, Durham, Haldimand, Halton, Hamilton, Kawartha Lakes, Niagara, Northumberland, Peel, Peterborough, Simcoe, Toronto, Waterloo, Wellington, York.

period of the significant increase in incineration capacity. The climax of incineration use in Toronto area appeared in 1965, when about 85 percent of generated waste was incinerated in eight large-scale facilities and in the numerous small incinerators located in the apartment buildings (Smith, 2006).

Starting from the 1960s awareness around environmental and health impacts of incineration started to dominate the public stances. Community groups opposed incineration plants because of their poor environmental performance; however authorities and industry did not provide adequate response to these claims – environmental pollution caused by incinerators was not promptly addressed by introducing requirements for better air pollution system or imposing stricter emission requirements (Smith, 2006).

The consequent decline of incineration practices came during the 1970s and 1980s, when the industry expressed interest in developing incineration technologies and building new facilities; however, these plans did not enjoy political support due to the strong public demand for better air quality. Consequently, instead of introducing technological and regulatory improvements to the existing practices, the incineration option was gradually abandoned by shutting down existing incineration plants (Smith, 2006).

The incinerators that were shut down due to their poor environmental performance and consequent strong public opposition include the Commissioner Street Incinerator and City of Hamilton's Solid Waste Reduction Unit (SWARU). The Commissioner Street Incinerator was opened in Toronto in 1950 and was closed in 1988 because of the strong public demand. Initially, the incinerator did not have any air pollution system and represented a significant source of pollution. However, the prospect of large-scale upgrade of the facility to improve its environmental performance was opposed by the public. By 1988, Commissioner Street Incinerator managed about 10 percent of municipal solid waste generated in Toronto (Smith, 2006).

The SWARU processed about 100 000 tonnes of MSW per year. While managing about 40-60 percent of Hamilton's municipal solid waste, SWARU produced about 30 tonnes of contaminated fly ash daily (i.e. generated hazardous ash made up about 10 percent of the total incinerated waste). The plant opened in 1972, but was closed in 2004 because of the poor pollution control system. The SWARU facility was allowed to operate on the conditions approved from its very opening in 1972; therefore, no further restrictions in regard to its environmental performance were introduced. SWARU was named as the largest point source of dioxins in Canada (Smith, 2006; CIELAP, 2007).

Due to the significant decline of the incineration capacity, generated MSW was mainly diverted towards landfilling. However, similar to incineration, landfills were also strongly opposed by the public that made the siting of any new facility impossible. Few attempts to do so failed that resulted in the export of waste from Greater Toronto Area to the landfill in Michigan (Smith, 2006).

The only thermal treatment plant opened in Ontario during the last few decades was the Peel Waste-To-Energy facility, that started to operate in 1992. Shortly thereafter, the Provincial government, under the leadership of the New Democratic Party, imposed a moratorium on the construction of any new thermal

treatment facility (Smith 2006; CIELAP, 2007). The ban on incineration was introduced based on the following reasons (Sawell, Hetherington & Chandler, 1996, p. 354):

- 1) Threat to human health and the environment;
- 2) Creation of large quantities of ash;
- 3) Incompatibility with the 3Rs (reduce, reuse, recycle);
- 4) The most expensive waste management option;
- 5) Inconsistency with Ontario's pollution prevention strategy.

The above arguments are thoroughly explained in the publication prepared by the Ministry of the Environment of Ontario in 1992 - "The case against municipal solid waste incineration." Below are a few excerpts from the document that clearly reveal the political stances against thermal treatment option:

Scientists believe there is no truly safe exposure level for many of the toxic contaminants emitted by incinerators. Lead is a good example. It is a cumulative poison which can attach the nervous system at extremely low doses. (p. 4).

... the ban is also based, in part, on unanswered environmental and health questions that have been raised about incineration emissions. For instance, scientists don't know enough about the long term toxic effects of many of the hundreds of other potentially dangerous compounds produced through incineration. There is great uncertainty about how these contaminants move through the environment, how quickly they break down (if at all), how they combine with other pollutants, or how they can build up in the food chain. ... In addition, the data collection on incinerator emissions is still largely incomplete. (p. 6).

Ironically, improvements in the efficiency of incinerator pollution control equipment – such as scrubbers and baghouses – has increased the concentration of contaminants remaining in fly ash. Tests conducted by Canada's National Incinerator Testing and Evaluation Program show that, as increasing controls are imposed on stack emissions, the quality of fly ash changes. The concentration of several toxic metals increases as does their potential for seeping out the ash into the environment. (p. 9).

The final per tonne cost of incineration would, in fact be higher because of the social and environmental costs of burning waste. Emissions, noise, dust, litter, odour and the risks associated with the transportation of waste and toxic residues add an estimated 10 percent to the "true cost" of incineration. Such costs should not be borne by the public taxpayer, but by generators of waste." (p. 11).

Ontario's ban on municipal waste incinerators sends a clear message that disposal is not the answer to environmental problems caused by waste generation. Our waste management priorities must be concentrated on the 3Rs, with emphasis on reduction. (p. 16).

After the Progressive Conservative government was elected in 1995, the moratorium was lifted followed by the introduction of new operating rules – Guideline A-7, "Combustion and Air Pollution Control Requirements for New Municipal Waste Incinerators." In contrast to the previous guidelines, Guideline A-7 introduced performance-based limits on air emissions. This novelty was believed to force facility operators to

employ the most advanced technologies of combustion and air pollution control (Sawell et al., 1996; CIELAP, 2007). As the report prepared by the Ministry of the Environment of Ontario in 1999 concludes “the risk assessments show that properly designed and operated municipal waste incinerators and landfills should not have a significant effect on human health and the environment” (p. 1).

Recent developments suggest that thermal treatment facility may regain its position in the Integrated Waste Management system of Ontario. For instance, Plasco Energy Group plans to build and operate a full-scale thermal treatment facility in Ottawa. York and Durham regions have also partnered to develop new thermal treatment capacities. Meanwhile, the introduction of thermal treatment practices for Toronto does not seem probable, as the focus is mainly driven towards increased diversion rates and the landfilling option. Consequently, Toronto aims to focus on the diversion and send the rest of the post-diversion waste to the newly purchased Green Lane landfill located in in Southwold Township, Elgin County (South, 2008; City of Toronto, 2008).

2.2.1.1 Algonquin Power Energy-From-Waste facility, Brampton, Peel Region

Algonquin Power Energy-From-Waste (APEFW) facility was opened in Brampton in 1992 and manages 160 000 tonnes of residential waste annually. In addition, the plant treats wastes from the industrial, commercial, and institutional sectors (IC&C). In 2004, APEFW and the cities of Peel Region municipality (cities of Mississauga, Brampton, and the Town of Caledon) signed the Waste Supply Agreement that enabled the APEFW facility to treat 65 percent of the residential waste produced in the region. The APEFW facility produces 15 MW of electricity per day (Region of Peel, 2008; Algonquin Power, 2007). Energy sales cover one third of the expenses, whereas the other two-thirds are paid off from the tipping fees (Smith, 2006). The tipping fees amount to CAD 83/tonne (Pollock, 2006).

The APEFW facility claims a strong environmental track record with the intention to exceed Ontario’s air emission standards (Pollock, 2006). In terms of public acceptance, the facility has received very few complaints about its operation and consequent odour, noise or emission problems. In fact, not many residents are aware of the existence of the waste treatment facility as it is located within the larger industrial area. Aside from the public acceptance, the facility enjoys political support as well (Smith, 2006).

In its long term waste management strategy, Peel Region considered thermal treatment as a component of an Integrated Waste Management System. The strategy aims for the maximum reduction, recycling and composting, and the energy recovery from the remaining waste. The rationale behind undertaking thermal treatment practice is explained as the possibility to reach a local solution to the waste management problem, to diversify waste disposal options, and to convert non-recyclable materials into a valuable resource (Pollock, 2006).

2.2.1.2 Plasco plasma gasification facility, Ottawa

In 2006 Ontario Cabinet approved two regulations⁷ that allowed Plasco Energy Group to develop a demonstration thermal treatment facility in Ottawa. The facility employed plasma gasification technology to manage 85 tonnes of waste daily and generate 5.2MW of electricity (CIELAP, 2007). In June, 2008 Ottawa City Council issued a letter that allowed Plasco to build, own and operate a full-scale thermal treatment facility with the capacity of 400 tonnes/day (Plasco Energy Group, 2008). The plant is planned to be constructed by 2016 (CBC News, 2012).

Plasco claims to produce clean energy from thermal treatment of waste. Firstly, the shredded waste is converted into a crude syngas that is sent for the plasma treatment to derive refined PlascoSyngas. Afterwards, PlascoSyngas is treated to remove pollutants and consequently, the result is a clean, energetic PlascoSyngas. Plasco Conversion system is said to recover the following from each tonne of the treated waste (MSW with a calorific value of 14,200 MJ/Tonne): 1.0 MWh of electricity, 300L of potable quality water, 7-15kg of metal, 150kg of construction aggregate, (Plasco Energy Group, 2011).

2.2.1.3 Niagara-Hamilton Energy-From-Waste facility⁸

Alongside the material recycling and centralized composting operations, Niagara-Hamilton EFW facility was part of the joint Niagara-Hamilton waste plan. The idea to collaborate on the development of the waste plan was initiated in 2003 and was dictated by the shared goals of the two municipalities: approved long term master plans for solid waste, the target of 65 percent diversion of waste from landfill, and the desire to manage their own waste (in the presence of the limited landfill space) (Niagara-Hamilton Waste Plan, 2008).

In 2004, the Niagara Region and the City of Hamilton signed an agreement to conduct a Joint Study on Waste Disposal that resulted in the Environmental Assessment study of different waste management options. Consequently, the following alternative disposal systems for post-diversion waste were evaluated (See Table 1) (MacViro Consultants & Jacques Whitford Limited, 2005a, p. ES-7):

Table 1 Alternative disposal systems for post-diversion waste

Alternative Disposal Systems for Post-diversion Waste		System Reference	Primary System Components
Mechanical Biological Treatment (MBT)/	MBT and Landfilling of stabilized residuals	1A	<ul style="list-style-type: none"> • Recovery of recyclables • Aerobic composting • Landfilling of residuals

⁷Environmental Registry Number: RA05E0021. Two regulations (one under the EAA and one under the EPA) exempt the demonstration project from the EAA and also from the hearing requirements of section 30 and 32 of the EPA (CIELAP, 2007).

⁸See Case Study II for details on Niagara Hamilton thermal treatment project.

Alternative Disposal Systems for Post-diversion Waste		System Reference	Primary System Components
Landfill	MBT with biogas recovery and infilling of stabilized residuals	1B	<ul style="list-style-type: none"> • Recovery of recyclables • Anaerobic digestion with biogas recovery and use • Landfilling of stabilized residuals
Thermal Treatment	Thermal treatment of mixed solid waste	2A	<ul style="list-style-type: none"> • Combustion (incineration) or gasification with syngas recovery and use • Landfilling of residuals
	Thermal treatment of mixed solid waste and recovery of materials from ash/char	2B	<ul style="list-style-type: none"> • Combustion (incineration) or gasification with syngas recovery and use • Mechanical treatment to recover materials from ash/char • Landfilling of residuals
	Thermal treatment of alternative fuel	2C	<ul style="list-style-type: none"> • Mechanical (and possibly biological) treatment to recover recyclables • Mechanical (and possibly biological) treatment to recover/prepare and alternative fuel • Combustion (incineration) or gasification with syngas recovery and use • Landfilling of residuals and ash/char
	Thermal treatment of alternative fuel with biogas recovery	2D	<ul style="list-style-type: none"> • Mechanical (and possibly biological) treatment to recover recyclables • Mechanical (and possibly biological) treatment to recover an alternative fuel • Anaerobic digestion with biogas recovery and use • Combustion (incineration) or gasification with syngas recovery and use • Landfilling of residuals, stabilized residuals and ash/char
Mixed Solid Waste Landfill	Landfilling of mixed solid waste	3A	<ul style="list-style-type: none"> • Landfilling of residuals
	Landfilling of mixed solid waste with recovery of landfill gas	3B	<ul style="list-style-type: none"> • Landfilling of residuals • Landfill gas (biogas) recovery and use

Source: MacViro Consultants and Jacques Whitford Limited, 2005a, p. ES-7

After the EA report was made publicly available, 106 comments were received out of which 50 percent approved the initiative, 25 percent opposed it and the rest were not directly relevant to the issue. It was decided to pursue further investigation based on the questions raised, especially in regard to the stabilized landfill option (CIELAP, 2007).

However, in the beginning of January, 2009 the Niagara Hamilton Waste Plan website (www.wasteplan.ca) informed that the joint initiative had been terminated and the website would be discontinued from January 31, 2009.

2.2.1.4 Durham-York thermal treatment project⁹

In order to avoid the present practice of exporting MSW waste to Michigan by finding the “local” solution to the waste problem, York and Durham Regions undertook a Residual Waste Planning Study. The report – “Evaluation of “Alternatives to” and identification of the preferred residuals processing systems- Recommendations” – was finalised in 2006 and concluded that the best alternative for the York-Durham region is thermal treatment of MSW with energy recovery, followed by the recovery of materials from ash/char (CIELAP, 2007; Durham/York Residual Waste Study, 2008a). The study concluded that the new waste management system opens up an opportunity to: a) “recover recyclables not captured through curbside Blue Box collection, b) Recover energy from residual waste that cannot be recycled, c) Share costs for the planning, development and operations of a facility between municipalities” (Durham/York Residual Waste Study, 2008a).

Through the course of the EA process numerous consultation, workshop, and information sessions were held for the interested public (Januszkiewicz, 2008).

Durham and York Regions released a Request for Proposals (RFP) for “the design, construction, operation and maintenance of energy-from waste (EFW) facility.” Pre-qualified proponents included¹⁰ (Durham/York Residual Waste Study, 2008b):

- Covanta Energy Corporation
- Urbaser SA
- Veolia Environmental Services Waste to Energy Inc.; AMEC/Black and McDonald
- Wheelabrator Technologies Inc.
- Green Conversion Systems LLC (Formerly: WRSI/DESC Joint Venture; Fisia Babcock Environmental GmbH, Kiewit Industrial Company, Morgan Stanley Biomass LLC, Babcock & Wilcox)

On April 14, 2009 Covanta Energy Corporation was announced as the preferred vendor and on April 22, 2009 it was accepted by the Durham Regional Council. Covanta Energy Corporation proposed to design, permit, build, start up, commission and operate a mass-burn EFW facility with the annual capacity of 140000 tonnes. Covanta operates 35 facilities in the United states, out of which 24 were designed and built directly by

⁹See Case Study III for more details on Durham-York thermal treatment project

¹⁰The brief summary of the experience and strength of each of the company is presented by Nicholson (2008, p. 44):

- a) Veolia & Partner: Experience – 20 years and 80 EFW facilities. Strength – Teamed up with consulting firm and contracting firm that are well-known in Ontario. B) Covanta: Experience - 20 year and 30 EFW facilities. Strength - All but one of its EFW facilities are in the US, including one in Niagara Falls, NY. C) Green Conversion Systems LLC: Experience – Lead partner company formed in 1998 and references 1 EFW facility in Germany. Strength – Partnership of six companies, each with strong credentials in their respective area of experience. D) Wheelabrator: Experience – 30 years and 16 EFW facilities. Strength – Wholly owned subsidiary of the well-known Waste Management Inc. E) Urbaser SA.: Experience – 4 EFW facilities and 4 more in design phase. Strength - A one-stop shop for design, construction, finance and operation.

Covanta (The Regional Municipality of Durham, 2009). On June 28 2011, the Ministry of the Environment of Ontario issues the Certificate of Approval for the Durham-York thermal treatment facility (MOE, 2011a).

The expected capital costs of the thermal treatment facility is about CAD 200 million. The operational costs amount to CAD 16 million per year. The life-span of the plant is expected to be 25 years (Nicholson, 2008).

2.2.1.5 Halton Region thermal treatment project¹¹

In 2006, public discussions and surveys were conducted in Halton Region around the 2006-2010 Solid Waste Management strategy. The preference of extending existing waste diversion programs was revealed and the interest was expressed to investigate the possibility of introducing a thermal treatment option for the Region (The Regional Municipality of Halton, 2006).

In July, 2006 the Council approved the report “Condition two of approval under the Environmental Assessment Act for the Halton Waste Management Site, Joint Board Decision” (Report No: CA-41-06) that directed the staff to develop a business case of an Energy-from-Waste facility. The business case, developed by GENIVAR, aimed to investigate the best available technologies for different waste disposal scenarios and their economic and environmental implications, as well as any relevant community and social considerations (The Regional Municipality of Halton, 2007a).

One of the most widely discussed reports of the business case was Step4A peer reviewed report “Identification and description of potential health & environmental effects”. The representatives of the environmental groups relate the conclusions laid out in Step 4A report to the decision to terminate the project. However, officials explain that the site was not yet chosen that made it impossible to conduct detailed studies and site specific modelling of the airshed. Therefore, many questions on possible health and the environmental implications of the proposed plant were not answered by the general report making it difficult to proceed with the project.

2.2.2 Thermal treatment facilities in other provinces

2.2.2.1 Greater Vancouver Regional District Waste to Energy facility, Burnaby, British Columbia

Greater Vancouver Regional District (GVRD) started to consider thermal treatment of waste as an option to tackle the problem of the insufficient landfill capacity in the 1980s. A thermal treatment facility was opened in 1988 in Burnaby, close to the paper recycling plant (Smith, 2006).

¹¹See Case Study I for more details on Halton Region thermal treatment project.

Burnaby EFW facility is a mass-burn incinerator that produces steam, electricity, and ferrous metals. Because of the high operational costs for landfills and their long-term liability, the EFW facility becomes economically more attractive. For example, in 2005 the energy sales from Burnaby EFW facility generated CAD 12 million and CAD 0.5 million was gained from recovered ferrous metals (Smith, 2006).

Burnaby EFW facility enjoys strong political and public support and has a successful environmental and economic track record. Since the launch of its operations, the EFW plant has improved its environmental performance. In addition, since all the capital costs are already paid off, EFW plant offers waste treatment with the lowest cost (Smith, 2006). The operational costs are almost fully offset by the revenues from the steam and electrical sales (Greater Vancouver Regional District, 2007).

The positive experience of the Burnaby EFW facility may have contributed to the decision to investigate prospects of the thermal treatment option as an alternative to landfilling. Since the local disposal capacity is quickly diminishing (Cache Creek landfill) and the replacement of the old landfill with the proposed new one (Ashcroft landfill) met strong opposition, the Province proposed to construct six new EFW facilities. The increase of thermal treatment capacity is outlined in the discussion paper - Strategy for Updating the Solid Waste Management Plan – and is considered as a diversion practice contributing to the programme “Zero Waste Challenge”. Meanwhile, exporting waste through rail to Washington State is discussed as an interim plan (Kosmak, 2008).

The plan to expand thermal treatment practices not only received positive reviews, but also met some criticism. However, proponents of the plan highlight that the expansion of the thermal treatment capacity for MSW is in line with the Metro’s Greenhouse Gas Reduction strategy. Since Metro strives to produce energy for its local use, additional EFW facilities are favoured, as they are believed to produce power for 40 000 homes. In addition, the BC Energy Plan considers energy derived from the MSW as a bio-energy (Kosmak, 2008).

2.2.2.2 Prince Edward Island (PEI) EFW facility, Charlottetown

The PEI EFW facility was constructed in the early 1980s in Charlottetown with the primary objective to provide an alternative energy source. During the oil crisis of the 1970s the importance of alternatives became acute, especially for the import-dependent regions such as PEI (Smith, 2006).

In 1995, the EFW facility was connected with two other woodchip-fed district heating facilities to form one energy system. During this period the EFW facility was owned by a private company, TrigenEnergy Canada, Inc. that provided significant technological upgrades to the facility. Afterwards, the unified energy system was sold to a private operator – PEI energy systems (Smith, 2006).

The PEI EFW facility represents a semi-continuous starved air incinerator that manages about 30 000 tonnes of MSW/year. The EFW facility generates 151 000MWh of energy. The tipping fee remains on the

level of 1995 and amounts to CAD 65/tonnes and is much lower than the costs for other waste management options. For example, the tipping fee for landfilling is CAD 100/tonnes (Smith, 2006).

Similar to the Burnaby EFW facility, the thermal treatment plant in PEI has been supported by the public (Smith, 2006).

2.2.2.3 Enerkem waste gasification facilities in Quebec and Alberta

Enerkem is privately owned company established in 2000 and is recognized as a leader in the development and production of second generation biofuels. The company is financed by both United States and Canadian investors (Rho Ventures, Braemar Energy Ventures and The Solidarity Fund QFL) and also is supported by the Canadian government (NRCan, SDTC, Natural Resources Qc, AERI¹²). Currently Enerkem operates a pilot plant in Sherbrooke, Quebec and a demonstration plant in Westbury, Quebec. In addition, Enerkem signed a 25-year contract with the City of Edmonton about the supply of MSW with the amount of 100 000 tonnes/year (Mili, 2008).

The Sherbrooke pilot plant and research centre were opened in 2003 and to date have operated for 4000 hours. The plant produces syngas, methanol, and second-generation ethanol from about 20 different feedstock materials including municipal solid waste, forest residues, treated wood (Enerkem, 2010a).

The Westbury Plant is expected to produce 5 million litres of ethanol/year from treated wood. During the second phase of its expansion, the plant will treat pulp and paper waste as well as the municipal solid waste (Mili, 2008).

According to the 25-year agreement, Enerkem and GreenField Ethanol will build and operate a plant to convert sorted municipal solid waste into biofuels such as methanol and cellulosic ethanol. After meeting all the required regulatory environmental standards, a permit was granted under the Environmental Protection and Enhancement Act of the Province of Alberta to start construction of the facility. The construction of the plant started in the summer of 2010. After separation of recyclable and compostable fractions, the remaining waste stream will be supplied by the City of Edmonton in the amount of a minimum 100 000 tonnes/year. The plant is planned to produce 36 million litres of biofuels per year. Consequently, Edmonton is expected to achieve 90 percent diversion. In addition, it is expected that Alberta's CO₂ footprint will be reduced by 6 million tonnes over 25 years (Enerkem, 2010b; Mili, 2008).

Enerkem claims to provide proven and cost-effective technology that requires less capital costs and is profitable at lower scales. Its feedstock requirements are flexible, thus converting various waste materials into

¹²NRCan – Natural Resources Canada, SDTC – Sustainable Development Technology Canada, AERI - Alberta Energy Research Institute.

the valuable products. In addition, Enerkem technology is expected to produce zero emissions of dioxins and furans and operate a modest size plant without a smokestack (Mili, 2008).

The above discussion located thermal treatment of waste within the historical context. It described the past developments that shaped the industry and influenced how thermal treatment option is perceived today. The negative perception of thermal treatment plants is largely determined by the limited emission control of older incinerators. Historically, pollution system mainly removed the particulate matter but did not treat acidic gases, heavy metals, dioxins and furans. Consequent environmental pollution and health effects played a primary role in developing a firm and long-lasting opposition towards thermal treatment option. This section also described the present situation in terms of the existing scale of the thermal treatment industry in Canada.

The next section of the chapter focuses on the legal framework that regulates planning processes for thermal treatment plants in Ontario, Canada.

2.3 Legislative framework for planning thermal treatment facilities in Ontario

2.3.1 Environmental Protection Act (EPA)

The Ontario Environmental Protection Act which regulates waste management under Part V, prohibits the use, operation, establishment, alteration, enlargement or extension of any waste management system or waste management disposal site without receiving certificate of approval or provisional certificate of approval (Ontario EPA, Section 27 (1)). According to Article 30, Clause 1 of the EPA, a Tribunal hearing is required. However, Article 32, Clause 1, formulates the conditions when a Tribunal hearing is discretionary. The Ministry of the Environment can exempt a facility from the hearing requirement of the Section 30 of the EPA. An example of the granted exemption is the Plasco Energy Group demonstration plant (CIELAP, 2007). Such an exception is regulated by EPA Regulation 347 that defines what is the “municipal waste pilot project site” and sets conditions under which Section 30 of the EPA on application for the certificate of approval does not apply to the pilot projects. The conditions for the exemption apply when:

- (a) the applicant gives the Section 39 Director a written notice that,*
- (i) specifically mentions this subsection, and*
- (ii) requests that section 30 of the Act not apply; and*
- (b) the Section 39 Director is satisfied that 75 tonnes of municipal waste or less will be processed or disposed of at the site on any day. O. Reg. 102/07, s. 3; O. Reg. 337/09, s. 2 (1, 2)(EPA Regulation 347, Section 5.0.1).*

Regulation 347 under EPA provides definitions and regulations concerning waste management. According to this Regulation, “municipal waste” means:

*“(a) any waste, whether or not it is owned, controlled or managed by a municipality, except,
(i) hazardous waste,
(ii) liquid industrial waste, or
(iii) gaseous waste, and
(b) solid fuel, whether or not it is waste, that is derived in whole or in part from the waste included in clause (a);”*
(EPA Regulation 347, Definitions)

EPA Regulation 347 formulates standards for the location, maintenance, and operation of thermal treatment sites. According to Section 12, the location of the thermal treatment site shall be chosen in a way “to reduce the effects of nuisances such as dust, noise and traffic”. More detailed regulations also apply to the management of fly-ash from thermal treatment plant and its location. As for the design and the capacity of the thermal treatment equipment, it is required to be “of a type and size adequate to efficiently process the quantities of waste that may be expected, so that a minimum volume of residue is obtained.”

One of the important policy documents regulating the incineration of municipal solid waste in Ontario is the “Guideline A-7 – Combustion and Air Pollution Control Requirements for New Municipal Waste Incinerators.” This guideline was developed in 1996 and establishes minimum design and operating standards, emission control systems and emission limits from any size municipal waste incinerators located in Ontario (CIELAP, 2007; Guideline A – 7, Introduction). The Guideline applies not only to new facilities, but also to those that are expected to be modified or expanded. The requirements set in Guideline – 7 complement Ontario Regulation 346 (RRO 1990), General – Air Pollution. As the Introduction chapter of the Guideline – 7 states, “The limits in the guideline for dioxins and furans, cadmium, lead, mercury, particulate matter and acid gases are technology based, developed using the maximum achievable control technology (MACT) principle, or in the case of the dioxin and furan limits, the Lowest Achievable Emission Rate principle” (Guideline A-7, Introduction).

In addition to Guideline A-7, the emission limits for Mercury, Dioxins and Furans from the municipal waste incinerators are regulated by Guideline A-8 – “Guideline for the Implementation of Canada-wide Standards for Emissions of Mercury and of Dioxins and Furans and Monitoring and Reporting Requirements for Municipal Waste Incinerators, Biomedical Waste Incinerators, Sewage Sludge Incinerators, Hazardous Waste Incinerators, Steel Manufacturing Electric Arc Furnaces, and Iron Sintering Plants”. Based on this guideline, Ontario formally adopted the Canada-wide standards for emissions of mercury, dioxins and furans from municipal waste and other types of incineration systems. The requirements set in Guideline A-8 are applicable to new and existing incinerators. Moreover, all the new incinerators must comply with the mercury, dioxin and furan emission limits within the first six months of their operation (Guideline A-8, Introduction).

2.3.2 Ontario Environmental Assessment Act (EEA)

A proposed thermal treatment project should undergo environmental assessment procedure according to the Environmental Assessment Act (EEA). As the Section 3 of the EEA reads:

“This Act applies to,

(a) enterprises or activities or proposals, plans or programs in respect of enterprises or activities by or on behalf of Her Majesty in right of Ontario or by a public body or public bodies or by a municipality or municipalities;

(b) major commercial or business enterprises or activities or proposals, plans or programs in respect of major commercial or business enterprises or activities of a person or persons, other than a person referred to in clause (a), designated by the regulations;

(c) an enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program. R.S.O. 1990, c. E.18, s. 3; 2001, c. 9, Sched. G, s. 3 (3).”

While carrying out an EA for the proposed project, a proponent should provide the purpose and the rationale for the undertaking and describe alternative methods of carrying out the project, and the alternatives of the undertaking itself. The EA evaluates environmental impact of presented alternatives (CIELAP, 2007). Figure 2 details the steps of the Environmental Assessment process in Ontario (MOE, 2011a).

Major amendments to the EEA were introduced in 1996, after the call to streamline the environmental assessment process. Consequently, Bill 76 was passed and enforced in 1997. The aim of the introduced changes was to make the environmental assessment process less time-consuming and costly, and more effective. However, the amendments proved to be controversial – some argued that they did not go far enough and others claimed that they hindered environmental protection. One of the changes that were introduced in 1996 was related to the intervenor funding regime that was initially approved in 1988 by the *Intervenor Funding Project Act*. In 1996 the *Act* expired and no other funding program was proposed instead. (Levy, 2002).

2.3.2.1 Requirements for public participation in environmental assessment process

According to the requirements in the EEA, public participation during the environmental assessment process of the proposed project occurs on several stages (See Figure 2). The first phase of the public participation should occur during the preparation of Terms of Reference (ToR). This is a mandatory procedure that must be documented and submitted to the ministry and must involve consultations with the public, Aboriginal communities and government agencies. After the submission of the ToR, the Ministry staff consults with the public before forwarding a recommendation to the Minister regarding the submitted ToR (MOE, 2011a).

The second phase of the public participation must occur during the preparation of the environmental assessment document (given that the submitted ToR has been approved). Similar to the previous public participation process, the consultations with the public, Aboriginal communities and government agencies regarding the environmental assessment document should be documented and submitted to the ministry (MOE, 2011a).

After the environmental assessment document is submitted to the Ministry, the public is given seven weeks to provide comments on the EA directly to the ministry. The analysis of the submitted comments is included in the “Ministry Review” that ministry staff prepares (MOE, 2011a).

Once the Ministry Review is published, interested public has five weeks to provide their comments to the Ministry of the Environment regarding the prepared Ministry Review (MOE, 2011a).

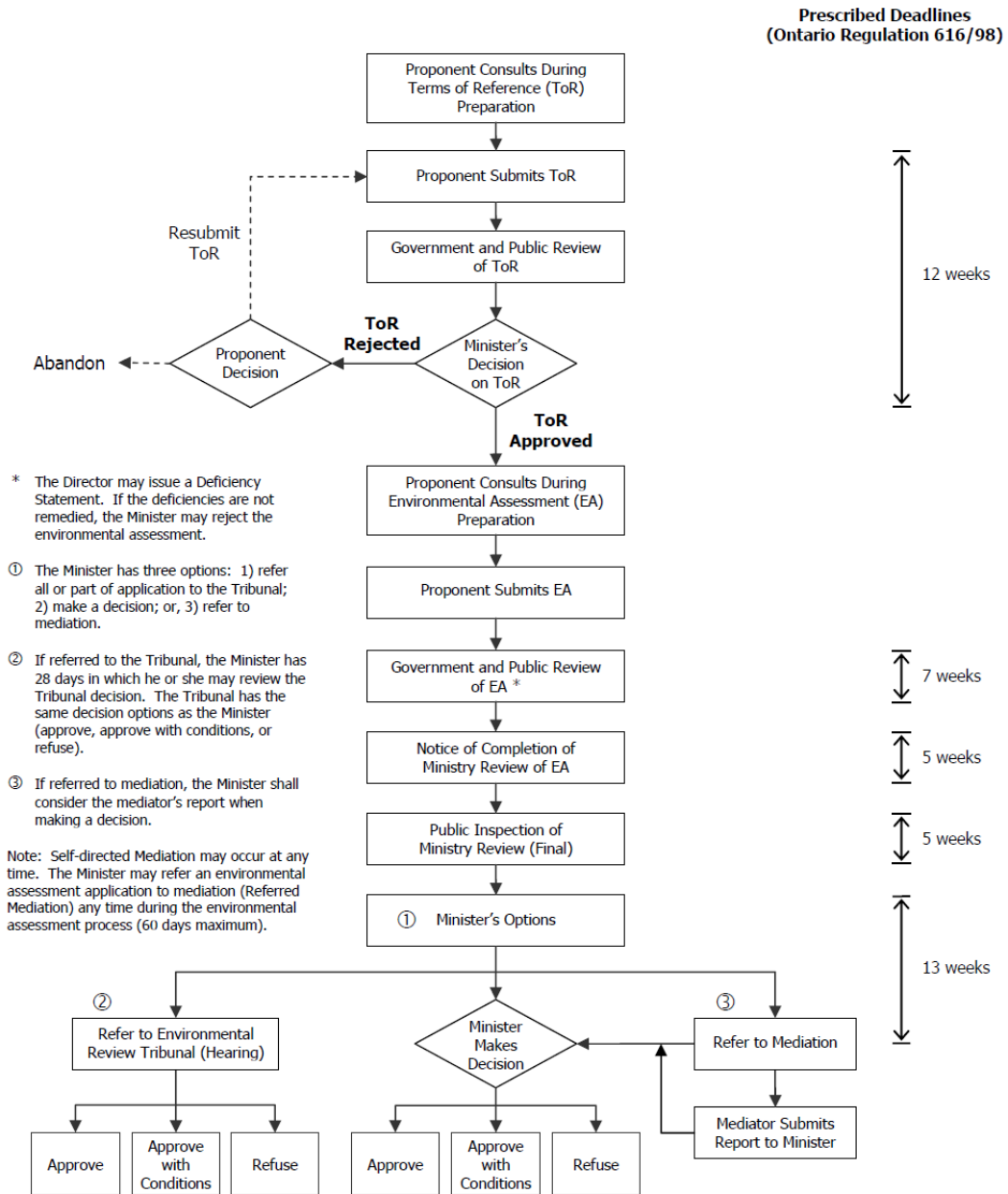


Figure 2 Environmental Assessment process in Ontario

Source: Ministry of the Environment of Ontario, 2011a

2.3.2.2 Ontario Regulation 101/07 on Waste Management Projects

Waste Management Projects Regulation (o.Reg. 101/07) was promulgated in March 2007 under the EAA. The aim of introducing the regulation was to streamline the approval process for waste management options. Traditionally, the Environmental Assessment process was only applicable to public projects. However,

according to the Regulation, the EA requirements now apply equally to public and private projects (MOE, 2007).

According to Regulation 101/07, waste management projects may fall under one of the three process streams based on their potential impact on the environment. Projects with the potential for significant environmental effect fall under the first process stream and therefore, require preparation of a Terms of Reference and individual environmental assessment. Projects that are expected to have predictable environmental effects that can be readily mitigated belong to the second process stream. These projects must undergo the Environmental Screening Process and the proponents are not required to prepare the individual environmental assessment. Environmental Screening Process is a proponent-driven, self-assessment process and therefore, the prepared reports are not approved by the Ministry of the Environment. However, the proponent is expected to consult with the affected government agencies. Projects that have minimal environmental effects fall under the third process stream and do not require approval under the EEA (MOE, 2007).

According to Regulation 101/07, Table 2 summarizes which projects for thermal treatment of waste require completing individual environmental assessment, undergoing environmental screening process, or are exempt for the environmental assessment requirements.

Table 2 Environmental assessment requirements applied to the projects for thermal treatment of waste under Ontario Regulation 101/07

Type of waste disposal site	Action	Description	Section of the Regulation 101/07
Projects subject to Environmental Assessment under Part II of Act			
Thermal treatment site	Establish	A thermal treatment site that uses coal, oil or petroleum coke as a fuel for thermal treatment.	2(1)2
Thermal treatment site	Establish	A thermal treatment site <ul style="list-style-type: none"> (i) That does not use coal, oil or petroleum coke as a fuel for thermal treatment; (ii) When more than 10 tonnes per day is the maximum amount of waste subject to thermal treatment; and (iii) Of the energy or fuel generated by thermal treatment at the site that is used, all of the energy or fuel is used to dispose of waste (i.e. No Energy From Waste [EFW]) 	2(1)3
Thermal treatment site	Change	A change to a thermal treatment site where: <ul style="list-style-type: none"> (i) Before the change, of the energy or fuel generated by thermal treatment at the site that is used, not all of the energy or fuel is used to dispose of waste (i.e. EFW), and (ii) After the change, the site produces No 	7

Type of waste disposal site	Action	Description	Section of the Regulation 101/07
		EFW.	
Thermal treatment site – described in section: 2(1)2 or 2(1)3	Change	A change that increases the amount of waste that is authorized to be thermally treated at the site on any day.	8(1)
Thermal treatment site – hazardous or liquid industrial waste	Change	A change that increases the amount of waste that is authorized to be thermally treated at the site on any day.	8(2)
Projects subject to fulfilling the environmental screening process			
Thermal treatment site	Establish	A thermal treatment site that does not use coal, oil or petroleum coke as a fuel for thermal treatment and that produces EFW.	11(1)2
Thermal treatment site	Establish	A thermal treatment site <ul style="list-style-type: none"> (i) That does not use coal, oil or petroleum coke as a fuel for thermal treatment; (ii) Where 10tpd or less is the maximum amount of waste subject to thermal treatment; and (iii) Where No EFW is produced. 	11(1)3
Thermal treatment site	Establish	A thermal treatment site that uses coal, oil or petroleum coke as a fuel for thermal treatment, if: <ul style="list-style-type: none"> (i) The site is located at a commercial, industrial or manufacturing facility; (ii) The primary purpose of the facility is not waste management; (iii) More than 100 tpd are received at the facility; and (iv) EFW is produced at the site and all of the EFW produced is used at the facility. 	11(2)
Thermal treatment site – described in section: 11(1)2, 11(1)3 or 11(2)	Change	A change that increases the amount of waste that is authorized to be thermally treated at the site on any day.	16
Projects that are exempt from Part II of Act			
Thermal treatment site	Establish	A thermal treatment site that would cease operation within 12 months of waste first being received at the site.	23(3)
Thermal treatment site	Establish or Change	A thermal treatment site, if: <ul style="list-style-type: none"> (i) The site is located at a commercial, industrial or manufacturing facility, (ii) The primary purpose of the facility is not waste management, (iii) Not more than 100 tpd are received at the facility, and (iv) EFW is produced at the site and all of the EFW produced is used at the facility. 	23 (4)
Thermal treatment site	Establish or Change	A thermal treatment site, if: <ul style="list-style-type: none"> (i) The site is located at a commercial, industrial or manufacturing facility, (ii) The primary purpose of the facility is not waste management. (iii) All of the waste that is subject to thermal treatment at the site is generated at the facility, and (iv) No EFW is produced. 	23(5)

Source: Ontario Regulation 101/07, MOE, 2007

2.3.2.3 Ontario Regulation 116/01 on Electricity projects

Ontario Regulation 116/01 was introduced in 2001 and presents new environmental assessment requirements for electricity projects that equally apply to public and private sector projects. Previously, the EAA applied only to public sector projects (undertaken by the successor companies of Ontario Hydro, municipal electricity corporations or other public bodies) and not to the private sector projects (MOE, 2011b).

According to Regulation 116/01, the electricity projects are grouped into three categories. Projects with expected minimal environmental effects fall under Category A and therefore, are not required to have an approval under the EAA. Category B unifies projects that have potential environmental effects that can be mitigated. These projects do not require an individual EA, but need to complete the Environmental Screening Process. However, in case of outstanding environmental concerns, the public and agencies can request project to be elevated from Category B to Category C. Lastly, projects with known significant environmental effects belong to Category C and require an individual EA. For example, all the new projects for coal-fired generation plants are subject to full environmental assessment and therefore, are not encouraged by the new Regulation (MOE, 2011b).

Thermal treatment projects for waste management that generated electricity, aside from being subject to Regulation 101/07, fall under the Regulation 116/01. The detailed requirements are presented in Table 3.

Table 3 Environmental assessment requirements applied to the projects for thermal treatment of waste under Ontario Regulation 116/01

Electricity Project Type	Category A: No EAA Requirements	Category B: Environmental Screening Process	Category C: Individual EA
Municipal Solid Waste	-	<ul style="list-style-type: none"> • For which an Environmental Protection Act section 30 hearing is not required (facilities incinerating less than 1500 persons domestic waste); or • That incinerates 100 tonnes or more of municipal waste on any day 	<ul style="list-style-type: none"> • For which an Environmental Protection Act section 30 hearing would be required (facilities incinerating 1500 persons domestic waste or more); or • That incinerates 100 tonnes or more of municipal waste on any day

Source: Ontario Regulation 116/01, MOE, 2011b.

2.3.2.4 Criticism of Environmental Assessment process in Ontario

The introduction of the sectoral regulatory exemptions, such as Electricity Project Regulations and Waste Management Project Regulations has been subject to criticism due to the fact that some of the projects with potentially significant environmental impact may fall under the categories that do not require the full individual EA and corresponding public discussions. In case of the Waste Management Project Regulation, it is argued that the introduction of this Regulation can be considered premature given that the Province hasn't

yet developed an overall framework for waste management that would give an idea about the priority directions for developing waste management sector (Lindgren & Dunn, 2010).

The other array of criticism concerns several roles that MOE fulfils including the development and introduction of regulations and requirements and issuing the Certificate of Approval. The decisions over referral of an application to Tribunal and about scoped EAs may be added to this list. As for the referral of application to Tribunal, under Article 9.3 of EEA the Environment Minister can refer an application (both individual and class EAs) to the Environmental Review Tribunal (ERT) for a public hearing and decision. Such referral can be requested by the public and the Minister has a right to refuse it if “(a) the Minister considers the request to be frivolous or vexatious; (b) the Minister considers a hearing to be unnecessary; or (c) the Minister considers that a hearing may cause undue delay in determining the application.” The statistics reveals, that since 1996 only two applications have been referred to the ERT and the rest have been refused by the Minister (Lindgren & Dunn, 2010). Lindgren & Dunn (2010) conclude that “at present time, virtually all EAA applications are being decided (and typically approved) by the Minister without any hearing whatsoever” (p. 293). Consequently, such a trend largely undermines the participation of all the interested stakeholders and meaningful public consultation process.

In case of the approval by the Minister of “scoped” ToR, such issues as the rationale and “alternatives to” are scoped out of the EA process and do not become a subject of discussion or debate, if the project goes to a hearing. This trend has been particularly noticeable in relation to waste-related projects, whereas some landfill projects undergo full EA and others are subject to scoped EAs (Lindgren & Dunn, 2010).

2.3.3 Waste Diversion Act (WDA)

One of the recent Ontario legislative initiatives, that does not directly affect thermal treatment option but may significantly influence its further developments, is the Waste Diversion Act (WDA). The purpose of the WDA is “to promote the reduction, reuse and recycling of waste and to provide for the development, implementation and operation of waste diversion programs” (WDA, Purpose). The diversion programs are to be developed by Waste Diversion Ontario, an entity established by the WDA, and in collaboration with industry funding organization (WDA, Section 23). The waste diversion programs developed under the WDA for a designated waste are prohibited from promoting, among others, burning of the designated waste (WDA, Section 25 (2)). The designated waste under the WDA include: blue box materials (glass, metal, paper, plastic and textiles), used tires, used oil materials, waste electrical and electronic equipment (CIELAP, 2007).

WDA promotes waste reduction, reuse and recycling practices through establishing Industry Funding Organizations (IFO) for funding waste diversion programs (e.g. Blue Box) (CIELAP, 2008). Although the WDA neither mentions the term “Extended Producer Responsibility” (EPR), nor services as a mechanism of its introduction, the tendency towards adopting EPR schemes for the designated waste is obvious. Such a development means that the producers will bear full responsibility (including financial) for the management

of their end-of-life products, and consequently, the municipalities will not be responsible for the management of the designated waste streams. Therefore, some believe that such a tendency will result in much less waste for the municipalities to manage and, therefore their interest in operating thermal treatment plants will significantly diminish (as commonly used mass-burn incinerators are characterised by the economy of scale). On the other hand, it is noted that despite active diversion attempts, there will still be residual waste that will require safe disposal and, therefore, thermal treatment may still be a viable option to pursue. However, in case most of the recyclables, including plastics and paper, are reclaimed through diversion, the residual waste for thermal treatment will have less energy value.

The description of the legal framework set a legislative context within which planning processes unfold in Ontario. As the subsequent case studies describe such processes in more details, it was important to understand the legal mechanisms that regulate them. Particular attention was paid to the public participation requirements during environmental assessment process and the categorisation of waste management projects that fall under different process streams.

As the previous sections located thermal treatment of waste within the broader context and provided a general overview of the past and present developments, the thesis now turns to the discussion about public opposition towards locally unwanted land uses and in particular, waste management facilities.

2.4 Equity dimension of planning waste management facilities

2.4.1 Who is the public?

When it comes to public participation discourse, “who is public?” is the central question. As Warriner (1997) notes, “the unfortunate tendency within environmental planning has been to confuse the sociological concept of *public* with something else, *mass society*” (p. 184). Indeed, the increase in the number of participating individuals does not necessarily trigger public involvement. Meaningful public participation involves the interest and commitment of the public to contribute to the planning process. An affected public must be notified about the planned project, policy, or event as it may directly or indirectly affect them. However, not all of the affected public will be the interested public. During the planning process, “the presence of the

affected, but uninterested, public does not add anything really meaningful to the consultative process, while usually amounting to a significant drain on resources” (Warriner, 1997, p. 186).

Susskind (1985) introduces an interesting categorisation of actors that make up communities. These are *boosters* who favour almost any initiative that brings material benefits (e.g. in the form of tax revenue or new jobs), *preservationists* who usually oppose any project that may result in negative environmental impacts or that may alter the community character, *guardians* who stand in between the above radical groups and whose position depends on the sound argumentation and fairness and transparency of the planning process, and the *nonparticipants* who, for a variety of reasons, do not participate. Susskind (1985) notes that up to 50 percent of a community’s population belongs to the group of guardians¹³. A similar classification of public is presented by Jenkins-Smith and Kunreuther (2001) who introduce the notion of *hard-core opponents* who consider the proposed facility or project completely or mostly unacceptable and do not change their minds during the planning process, *hard-core supporters* who completely or mostly accept the facility or project and do not change their minds during the planning process, and *moveables* who change their acceptance as different scenarios are presented. In line with the observation by Susskind (1985), Jenkins-Smith and Kunreuther (2001) conclude that most of the respondents that they surveyed belonged to the “moveables” category.

The above discussion is in line with the views expressed by Petts (1994b), who notes that the heterogeneous character of the public is a result of the diversity of concerns, interests, approaches, and experiences. Therefore, “a tendency to believe that everyone in a local community will have the same agenda can lead to a misunderstanding of information requirements, and a failure to communicate concepts and plans effectively” (Petts, 1994b, p. 209).

Although boosters and preservationists represent interested public, the group of guardians, as defined by Susskind (1985), is of particular interest for the study of public acceptance of waste disposal facilities. This group of community members does not have a pre-determined position, but rather formulates its stances based on the quality of presented arguments and judges according to the fairness and openness of the process. Therefore, issues of fairness and equity during the planning process are directly pertinent to this type of interested public.

2.4.2 Public opposition towards waste disposal facilities

2.4.2.1 NIMBY and beyond

The concept of Not In My Back Yard (NIMBY) emerged in the literature and planning practice in the early 1980s and referred to the negative social response to the facility siting decisions. Aside from NIMBY, other

¹³McComas (2001) compares participants and nonparticipants of public meetings about local waste management problems. A comparison of demographic characteristics reveals that those who participate more actively tend to earn higher incomes and have children in their households. In addition, participants belonging to the age group of 40-65 years are most active. It is also noted that more research is needed to investigate whether participants of the meetings typically represent those who do not participate.

acronyms were introduced that also relate to unwanted facilities. These include LULU (Locally Unwanted Land Uses), NIABY (Not In Anybody's Back Yard), NIMTOO (Not In My Term Of Office), BANANA (Build Absolutely Nothing Anywhere Near Anyone), NOPE (Not On Planet Earth), and CAVE (Citizens Against Virtually Everything) (Schively, 2007, p. 255). Cavatassi and Atkinson (2003) distinguish between NIMBY and NIABY (Not In Anybody's Back Yard). Whereas NIMBY is associated with the "net losers" living around the proposed site and their private concerns, NIABY adds wider social motives to the debate.

The prevailing assumption about the NIMBY syndrome is that local citizens accept "unwanted but necessary facilities anywhere but their own community", despite the technical characteristics or environmental performance of the proposed facility (Kikuchi & Gerardo, 2009, p. 1681). This group of citizens is viewed as those who want to utilize the benefits that the facility may offer, but are unwilling to share the costs associated with its functioning (Hunter & Leyden, 1995). By revisiting the above discussion on characteristics of different public groups, NIMBY activists can be associated with preservationists or hard-core opponents - those who oppose any type of development in close proximity to their residence.

As Wolsink and Devilee (2009) note, the motives of an opposing public are "often reduced to simple protection of 'their backyard'" by assigning the label NIMBY as an "'explanation' for opposition" (p. 218). The NIMBY sentiments are closely related to the rational response of the community members who "perceive an imbalance between the benefits they will receive from hosting a facility, such as jobs and tax revenues, and the costs they will bear, such as lower property values, potential risks to the environment and health, noise and odour, and a lessening of community image" (Lober, 1995, p. 500). Such thinking is backed by the original approach of viewing siting problems from an economic perspective in terms of costs and benefits. The benefits of constructing a waste disposal facility can have public good value, whereas costs are born individually by members of the host community. Therefore, this rationale calls for the redistribution of costs and benefits as well as introduction of the compensation schemes for the host community (Wolsink & Devilee, 2009). Petts (1994b) generalises the opposition towards siting waste disposal facilities and refers to LULUs (locally unacceptable land uses) as the widespread phenomenon fuelled by the fact that new developments are perceived to have "few direct benefits to the individuals, but to present many risks" (p. 207) and that such developments are viewed as an "unacceptable change to the status quo" (p. 207).

According to Kearney and Smith (1994), the main contributor for the failure to site new Low-Level Radioactive Waste (LLRW) disposal facilities is the NIMBY syndrome. The authors note that NIMBY phenomenon is common place in case of different LULUs but is particularly strong when it comes to radioactive and hazardous waste. When discussing public opposition towards siting nuclear waste repository in Sweden, Sjoberg and Drottz-Sjoberg (2001) explain that NIMBY mainly relates to the idea that "people accept that waste must be deposited *somewhere*, but that they do not accept it in their own community" (p. 87). Such an attitude is commonly labelled as irrational, emotional, and selfish.

The above explanation of NIMBY was challenged and critiqued for being narrowly defined and "crudely

summarized” (Rabe, 1994; Burningham et al., 2006, p. 7), and not reflecting the complexity of public opposition (Hunter & Leyden, 1995; Schively, 2007; Guidotti & Abercrombie, 2008). The complex nature of NIMBY is related to the fact that it can be applied to a wide range of different facilities (e.g. starting from prisons and ending with nuclear waste repositories), it usually encompasses a diversity of concerns (Schively, 2007), and it reveals the close correlation of private and social motives (Cavatassi & Atkinson, 2003). As a result, the dynamics of public opposition and the “agenda” behind a NIMBY response may be deeper than the conventional explanation of selfish behaviour to avoid siting the unwanted facility in the community (Guidotti & Abercrombie, 2008, p. 587). Luloff et al. (1998) note that in the literature the distinction between those who oppose facility siting because of its physical proximity to their residence and those who may have other reasons to oppose a particular site (e.g. the site may harm something that they value such as a national park or protected area) is overlooked. Consequently, all the opposition to the proposed siting project is readily labelled as NIMBY. Hunter and Leyden (1995) question the overreliance of using the term NIMBY in the relevant literature and note that the term “seems to mean too many things to too many scholars” (p. 601). In their critique of the traditional explanation of NIMBY, Kempton et al. (2005) refuse to use the term altogether because of the following three reasons: “first, it is generally used as a pejorative implying selfishness as an underlying cause; second, it appears to incorrectly describe much local opposition ...; and third, the actual causes of opposition are obscured, not explained, by the label” (p. 124).

Indeed, the determinants of public opposition towards locally unwanted facilities are diverse. One group of scholars relate NIMBY to lack of confidence in science and technology and lack of trust in government regulators (Pijawka & Mushkatel, 1991/1992; Kunreuther et al., 1993; Hunter & Leyden, 1995; Kikuchi & Gerardo, 2009; Bacot et al., 1994; Johnson, 1987). Others associate NIMBY with such issues as property values, aesthetics, health, and safety risks (O’Hare, 1977; Cavatassi & Atkinson, 2003) or study the role of knowledge and information in fuelling public opposition (Devine-Wright, 2009; Petts, 1997; Vittes et al., 1993; Wright, 1993). Some scholars focus on the importance of the core values in defining public position (Vittes et al., 1993; Ibitayo & Pijawka, 1999; Davies, 2001a). Overall, there is a disagreement on the actual reasons that cause public opposition (Hunter & Leyden, 1995). For example, the role of information and knowledge in supporting NIMBY sentiments is interpreted differently. Devine-Wright (2009) states that the opposition towards a proposed project is caused by the lack of knowledge regarding the problem or the technology. Following this logic, once more information is provided, the level of opposition should fall. However, qualitative studies reveal that those opposing proposed developments are often well informed (Petts, 1997). Petts (1997) states that once confronted with an issue of concern, the public is able to “access, handle and balance complex information if given sufficient time” and that “the public are not information-poor: they can capitalize upon a range of cultural and experiential resources” (p. 378). Vittes et al. (1993) found that education and provision of information further polarizes opposing sides. The authors observed that communities that received more information became more resistant. A similar conclusion is presented

by Wright (1993) after studying hazardous waste siting: “the more people know, in terms of nontechnical but issue-relevant information, the more likely they are to exhibit NIMBY attitudes and behaviour” (p. 258). The author suggests that the findings may be different if technical knowledge is measured. At the same time, Wright (1993) points out that the knowledge may not be gained objectively; that is, more information is obtained with the purpose of further opposing the project. This may be related to the costs associated with the consumption of information. Those who already have established their positions may not be willing to search further information, or in case they do, they select that information that reaffirms their position (Schively, 2007). Touching upon the connection between the level of public knowledge and opposition to the project, Wright (1993) points out that local opposition to a siting project has significantly increased, even though the regulations imposed on waste industry are stricter and more rigorous.

2.4.2.2 The notion of equity

The above discussion reveals that public opposition towards siting waste disposal facilities is attributed to a number of factors that range from the concerns over the diminishing market price of the real estate to the role of core values and principles. The earlier literature on siting waste management facilities focused mainly on the self-centred drivers that influence public opinion. Self-interest in terms of material well-being and the comparison of the expected costs and benefits of the proposed project were believed to be the major influencing factors during facility planning processes. Over the last two decades, however, the main focus of the siting discussions shifted from the issues of selfish motives and self-interest to the value dimension of the process – the perceptions of equity and justice have been examined as the crucial elements in formulating public stances (Kunreuther et al., 1993; Lober, 1995; Wolsink & Devilee, 2009; Schively, 2007; Smith & McDonough, 2001; Petts, 1992; Petts, 2005; Baxter et al., 1999; Gerard, 1994). Baxter et al. (1999), for example, view an “idealised model for competent and successful facility siting” (p. 503) as one where trust, equity, and public participation reinforce higher degree of public consensus and lead to successful facility siting. Wolsink and Devilee (2009) conclude that the “perceived environmental injustice, fairness of the process, and personal commitment to others” (p. 217) have to play the primary role in a siting process. Kunreuther et al. (1993) point out that the difficulty of siting waste management facilities is primarily related to the procedures that are often viewed to be unfair.

The notion of equity is not always straightforward and may be subject to discussion (Kasperson & Dow, 1991). In the academic literature, equity is explained as consisting of two components – distributional equity (fairness) and procedural equity (fairness) (Kasperson & Dow, 1991; Wolsink & Devilee, 2009; Smith & McDonough, 2001; Gerard, 1994; Mazmanian & Morell, 1990). The fairness of the process is a procedural notion and is strongly embedded in the existing institutional and legal structures (Wolsink & Devilee, 2009). While evaluating siting processes of hazardous and nuclear waste, Gerard (1994) notes that fairness encompasses aspects of both allocation and process. Smith and McDonough (2001) make a distinction

between procedural and distributive justice, however, adding that these two notions usually interact with each other: “fair procedures ameliorate negative reactions that would normally result from an unfair outcome. In addition, when procedures were unfair, fair outcomes could make participant reactions more positive” (p. 240). Later on, the authors conclude that “fair processes and fair outcomes may interact because they communicate the same thing – the people are being treated as ends in themselves, rather than as means to something else”(Smith & McDonough, 2001, p. 240). Similarly, Gross (2008) and Dietz and Stern (2008) note that people tend to accept outcomes that are reached through a fair decision-making process.

While discussing the notions of equity in relation to global environmental change, Kasperson and Dow (1991) distinguish between distributional equity and procedural equity. They define distributional equity as “the fairness of the distribution of substantive outcomes, or impacts, arising from a particular project, set of activities, or developmental path” (p. 151). Under outcome-oriented equity problems, the authors unify geographical equity, cumulative geographical equity, intergenerational equity, and social equity. Similarly, while discussing fairness of the siting decisions for hazardous and nuclear waste, Gerard (1994) distinguishes fairness among geographical areas, classes and races, and generations. Intergenerational fairness or considerations of fairness for future generations is referred as the “temporal fairness” in the report prepared for the Nuclear Waste Management Association by DPR (Micak et al., 2005). Procedural equity is defined as “the fairness of the particular set of procedures used to arrive at policies and decisions for managing global environmental hazards” (Kasperson & Dow, 1991, p.153).

Besley (2010) distinguishes outcome, procedural fairness, interpersonal fairness, and informational justice. The outcome is defined as the distributive fairness and is focused on the final result of the decision-making process. Procedural fairness deals with the process of decision-making while the interpersonal fairness “emphasizes the degree to which individuals feel decision makers are trustworthy and respectful of their views” (Besley, 2010, p.4). Informational justice speaks to the possibility of receiving an appropriate amount of information during the decision-making process. As Besley (2010) explains, “procedural, interpersonal, and informational justice are inherently associated with communication processes” (p. 4). After studying public perceptions of risks associated with municipal incinerators, Reams and Templet (1996) conclude that public perception of fairness of the decision-making system is one of the most significant factors influencing public stances.

The recognition that people cared not only about the fairness of outcome but also about the process itself emerged in the 1970s (Gross, 2008). Consequently, alongside the concept of substantive justice (outcomes), the notion of procedural justice (process) was introduced (Tyler, 1989; Smith & McDonough, 2001; Webler, 1995). Gross (2008) names the principles of procedural justice: “ability to participate and express voice, impartiality and trustworthiness of decision-making authority, adequate information, being able to raise issues and have them responded to, and being treated with respect” (p. 132). Besley (2010) explains that, as the last

few decades of the justice research indicates, the outcomes are not the only factor that matters in decision-making, but procedural and interpersonal justice also plays a significant role. In addition, procedural justice is believed to increase the level of satisfaction of the procedures and those who enforce them. Thus, the public may be more willing to accept the outcomes of the process (Besley & McComas, 2005).

On the other hand, Earle and Siegrist (2008) conclude that in case of the highly controversial projects, only outcomes and not process determines how people perceive the decision-making process. In such cases, the outcome or the distributive justice will be the primary determinant of the public's view on the proposed project. It is likely that in such cases the procedural fairness will fail to result in the cooperation and trust-building between the opposing parties (Earle & Siegrist, 2008, p. 1396).

Procedural and substantive equity formulate a core notion of the Social Equity Approach of siting locally unwanted waste facilities. A Social Equity Approach is one of three approaches proposed by Lawrence (1996). The other two are the Environmental Suitability Approach¹⁴ that takes a more rational turn and weighs different alternatives in terms of their environmental impacts, and the Community Control Approach that implies "a high degree of process and outcome control by interested and potentially affected individuals, groups and communities" (Lawrence, 1996, p. 169). The Social Equity Approach is oriented towards procedural and substantive equity, whereas "procedural equity pertains to fairness in the planning process, especially for groups and interests traditionally under-represented in planning and decision making and substantive equity is concerned with the fair distribution of facilities and benefits and costs among stakeholders and over space" (Lawrence, 1996, p. 167-168). This approach implies full stakeholder participation and the financial or other schemes of assistance that can lead to "further equity" (Lawrence, 1996, p. 168). Full stakeholder participation is considered one of the key criteria of procedural justice (Smith & McDonough, 2001).

With the recognition of the importance of both distributional and procedural equity considerations, concerns have been raised regarding the dominance of distributional equity discussions in the academic discourse (Lake, 1996; Watson & Bulkeley, 2005; Schlosberg, 2004). Environmental equity, environmental racism, and environmental justice are often used interchangeably and refer to the allocation issues of unwanted facilities in disadvantaged communities (Carr, 1996; Watson & Bulkeley, 2005). Watson and Bulkeley (2005) further explain that the environmental justice discussions around waste management issues were primarily focused on siting of hazardous waste facilities. Close association of siting discourse with environmental justice may be explained by the fact that the grassroots protests from which environmental justice grew were focused on the allocation effects of the disposal of hazardous waste (Watson & Bulkeley, 2005; Fletcher, 1998; Davies, 2006). Therefore, the main focus has been drawn on equitable distribution of environmental risks rather than on the system that produces such distribution (or final outcome) (Watson &

¹⁴This approach is very much in line with what is currently known as Environmental Impact Assessment.

Bulkeley, 2005). Such an approach was criticized by Lake (1996, p. 162) who notes that the environmental equity literature mainly focuses on distributive justice (siting outcomes) and even when it touches upon procedural justice, it offers “an unnecessarily truncated notion” of the latter. The author proposes considering procedural equity more in-depth. The focus should shift away from the procedural equity as a way of providing more equitable distribution of the burdens to the process “for deciding on production of the burdens that require distribution” (p. 164). Similarly, Schlosberg (2004) explains that as currently dominated theoretical visions of environmental justice are limited and encompass only the distributional issues, moving beyond this narrow understanding is needed.

Despite the dominance of distributional equity in the siting discourse, the tendency of acknowledging both distributional and procedural aspects of equity is evident. However, a more nuanced and comprehensive look at what constitutes distributional and procedural equity and at the key elements shaping these concepts is lacking. The efforts to analyze various elements of equity are dispersed and range from the issues of compensation to the problems of representation and voice.

Sjoberg and Drottz-Sjoberg (2001) note that moral issues - particularly the perceptions of fairness - play an important role in risk acceptability and risk tolerance during siting debates of nuclear waste repositories. The authors explain that this is not surprising as “risk debates are often about life and death” (p. 75) not only for the present generation, but also for the future one. Reams and Templet (1996) note that with the increase of overall health and economic well-being, the public’s tolerance towards environmental risks has decreased. Alongside the engagement level of the public, the importance of distance and the previous experience of hosting waste disposal facilities are considered factors influencing public perception of risk (Gallagher et al., 2008). Guidotti and Abercrombie (2008) conclude that past history of the community conditions shapes the response to the siting decisions. According to the authors, past experience of political issues affects the perception of the environmental issues by the community that “carries over into a NIMBY situation” (p. 587). This conclusion is particularly important, as community history may not be known to the stakeholders and project proponents and therefore they may lack the insight into the motives and concerns of the community members. In addition, an interesting observation is detected in relation to the property price variations and the development phase of the facility. Namely, the property prices in the host community are lower during the planning and construction phases of the waste disposal facility, while during the operation phase the prices tend to increase. This conclusion reveals that the perceived risk also decreases as the facility enters the routine operational phase (Gallagher et al., 2008). This phenomenon is explained by Elliott (1998, p. 361) who suggests that individuals cope better with “a known environmental stressor” (i.e. an existing incinerator) than “an unknown environmental stressor” (i.e. a proposed incinerator). The latter is associated with more uncertainty; consequently, individuals associate planned facilities with a higher risk level. As Elliot (1998) states, “once the waste facility is constructed and operational, anticipatory anxiety decreases,

psychosocial impacts decline, and the ever-adaptable human agent begins again to ‘get on with life’” (p. 362).

In regard to risk perceptions towards waste management facilities, risk communication appears to be a critical element of the planning process. Risk communication refers to the exchange of information about the health and environmental risk among stakeholders of the process. The risk communication process may encounter a number of difficulties such as message, source, channel, and receiver problems. However, the challenges of conducting effective risk communication process may be of a more fundamental nature and may be connected with the “different value judgement positions” of the involved parties (Petts, 1992, p. 172). Risks, costs, and benefits are believed to be unevenly distributed in society; therefore, the issues of equity and fairness should be taken into account during the risk management process. This discussion relates to the issues of compensation, although Petts (1992) notes that often host communities prefer risk reduction strategies to financial compensations.

Petts (1994b) notes that poorly managed waste management facilities could strengthen negative public stances. Therefore, improvement of existing waste management operations and promotion of waste minimisation, recycling, and recovery practices could contribute to increased public acceptance. Johnson (1987) refers to the “trust as history” (p. 580) and explains that any serious problem that may emerge in relation to nuclear power will cause increase of public distrust and scepticism and make discussion on nuclear waste management salient. Similarly, the accidents or management errors that may involve hazardous chemical substances trigger public opposition towards siting hazardous waste facilities (Johnson, 1987).

Webler and Tuler (2000) propose a normative theory of public participation that consists of two principles: fairness and competence. Fairness implies that people are given opportunity to attend, initiate discourse, and participate in discussion and decision-making. Competence is explained as consisting of two basic necessities: “access to information and its interpretations and the use of the best available procedures for knowledge selection” (Webler & Tuler, 2000, p. 572). Webler’s and Tuler’s (2000) conceptualization of fairness echoes Smith and McDonough’s (2001) explanation of the fairness of decisions that is related to the issues of representation, voice, and consideration. Similarly, while analyzing public participation practices during land-use planning decision making in Ontario, Illsley (2003) distinguishes voice and use of information among the determinants of the fair process. Representation is explained as “the diversity and broadness of types of people involved” (Smith & McDonough, 2001, p. 244). The question of acquiring voice implies different possibilities of expressing concerns, becoming involved in discussions, and participating in decision-making process. However, being given an opportunity to participate and speak up is not deemed sufficient. In order not to turn public participation merely into a formal exercise, it is necessary to ensure that the voiced concerns and suggestions are considered (Smith & McDonough, 2001).

Petts (1994b) clusters the issues relevant to public acceptance of waste disposal facilities into the following groups: 1) the psychological and social dimension (risk perception and factors that influence this perception); 2) the trust and credibility dimension (trust and institutional control including industry, policy and regulatory

system, and monitoring by regulatory agencies and plant operators); 3) the information dimension (public relations, provision of information, and risk assessment); and 4) the decision-making dimension (improving decision process and involving all the interested parties, risk compensation, improving risk communication, and EIA). At the same time, Joos et al. (1999) present ways to improve public acceptance of waste disposal facilities: strengthen “information and public relations activities, increase financial transparency and carry out dialogue with the public and other cantons¹⁵” (p. 421). The importance of conducting a dialogue is particularly stressed and viewed as the way to reach consensus. Consensus-building will empower the public and result in a fair decision that can be regarded as the best possible decision in the given circumstances. Petts (1994b) also stresses the importance of conducting open debates and achieving informed consensus among the parties for ensuring the effective functioning of the waste management system.

The relationship between decision-makers and the public is particularly stressed while discussing the role of politicians during planning processes for waste management facilities. After studying various siting cases of waste management facilities, Lawrence (1996) concludes that “political involvement is pivotal to the process” (p. 181). Political support or opposition to the proposed project can largely influence the outcome of the planning process.

Smith and McDonough (2001) note that the “perception of justice in decision outcomes and processes increases trust, support for authorities, and satisfaction with unfavourable outcomes” (p. 239). Trust is named as the prerequisite for consensus-building and dispute resolution (Baxter et al., 1999; Lober, 1995; Hunter & Leyden, 1995; Ibitayo & Pijawka, 1999; Johnson, 1987; Llurdes et al., 2003; Bacot et al., 1994). Lober (1995) adds that trust in institutions involved in siting and the fairness of the decision-making process contributes to the formation of public risk perceptions and attitudes. According to Baxter et al. (1999), “trust may be considered as a *principle* of effective siting while public participation is a *practive* for building trust” (p. 503). After studying opposition to a hazardous waste incinerator, Hunter and Leyden (1995) reveal less evidence of the concerns over the property values and aesthetics. Instead they infer that the opposition is closely related to the lack of “trust in government, fear of health consequences, and other ideological and demographic factors” (Hunter & Leyden, 1995, p. 601). Ibitayo and Pijawka (1999) conducted a nation-wide survey in the US about state siting attempts of hazardous waste management facilities between 1989 and 1999 and concluded that the conditions associated with higher likelihood of successful siting are “public trust (especially in the facility developer), early and continuous public involvement in the facility siting process, and an adaptive strategy that involves incorporating citizens’ concerns into siting and operating decisions” (p. 379). Similarly, Davis (1986) defines the early involvement of public in siting processes as “major noneconomic approach to the amelioration of citizen discontent” (p. 299).

¹⁵The research was conducted in Switzerland.

Bacot et al. (1994) point out the significance of cultivating trust by government and industry among those who may be affected by the facility location. At the same time, the authors note that trust alone may not be sufficient for conducting effective siting process. While discussing siting problems for nuclear and chemical waste facilities in the US, Johnson (1987) notes that if there is no trust, the public will not be willing to accept a proposed facility despite offered incentives or proposed technical capacities of the facility. Llundurdes et al. (2003) note the “asymmetrical nature of trust” (p. 337) when gaining trust is a difficult and long process, whereas its loss can happen very easily and quickly. The authors add that trust proves to be an essential success factor in the risk communication process.

According to Gallagher et al. (2008), a compensation mechanism is introduced as an attempt “to at least partially offset the external costs falling on host communities, thus reducing public opposition” (p. 233). Compensation strategy is associated with the rational choice theory and implies that the public opposition will be lessened in cases where the offered economic benefits outweigh the risks posed by the facility (Ibitayo & Pijawka, 1999); consequently, a NIMBY reaction can be minimized (Kikuchi & Gerardo, 2009). Compensation mechanisms are defined as the means to transfer the resources from those who benefit to those who are negatively affected by the facility, thus “eliminating unfairness” (Claro, 2007, p. 190).

Despite positioning compensation schemes as a feasible way to reduce public opposition, their effectiveness has been doubted. Davis (1986) concludes that in case of hazardous waste facilities, efforts to disseminate information and widen public involvement are more effective than provision of incentive. Schively (2007) questions the effectiveness of compensation mechanism as during the siting process “moral principles play an important role, and, thus, monetary incentives are often downplayed” (p. 260). Lidskog (1998) names another reason that may help to explain why economic incentives are not always effective to lower the public resistance. The author explains that *different meanings* are assigned to the proposed project. For example, the developer may consider that the proposed plant does not pose any significant threat, whereas residents of the neighbouring area may think otherwise. Luloff et al. (1998) point out that so-called incentive packages are a controversial issue, particularly in the light of the environmental justice and equity literature. The latter is due to the fact that such packages are mostly offered to “economically vulnerable and politically weak communities” (Luloff et al., 1998, p. 84).

Although there is evidence that compensation mechanisms do not always contribute towards reducing public opposition, the reported case studies reveal that the effectiveness of the compensation strategy may be dependent on type of facility, public stances, and type of offered incentives. After conducting a case study on siting a landfill in Tennessee, Bacot et al. (1994) conclude that the willingness to accept incentives depends on the citizen’s attitude towards the proposed facility. Namely, those who are strongly opposed are not likely to accept any incentives, whereas those “exhibiting less opposition” (Bacot et al., 1994, p. 232) are more willing to accept proposed incentives, particularly economic ones. Similar conclusions are offered by Jenkins-Smith and Kunreuther (2001) who studied public acceptance of four types of facilities: prison, landfill, incinerator

and nuclear waste repository, and examined the acceptance of different compensation measures¹⁶. The study revealed that hard-core opponents have much more negative opinions about compensation measures than hard-core supporters or movables whose attitude towards proposed compensation measures is more positive. In general, it was concluded that the riskier the facility is perceived to be, the less is the attractiveness of compensation measures. For example, proposed compensation measures were considered to be less appropriate in case of repository and incineration compared to landfill and prison.

The latter conclusion is shared by Chung et al. (2008) who note that for some facilities, especially those that may have significant impact on human health and the environment (e.g. nuclear power plants), compensation may not prove viable. According to Sjoberg and Drottz-Sjoberg (2001), resistance to accept economic compensation may be related to the perception of nuclear power as a general rather than a personal issue. In other words, questions often related to nuclear power are regarded as having general (and often political) rather than personal importance. In case of radioactive waste repositories, compensation either does not change the percentage of individuals supporting a repository or may even decrease the fractions supporting such a facility (Jenkins-Smith & Kunreuther, 2001; Kunreuther & Easterling, 1996; Chung et al., 2008).

Claro (2007) investigates the effectiveness of financial compensation versus in-kind or public good compensation for siting a waste disposal facility in Santiago, Chile. Based on the reviewed literature, Claro (2007) states that monetary compensation increases willingness to accept the facility by the local population; however, often such compensation schemes prove to be ineffective. Instead, many argue that the alternative option of providing in-kind or public goods compensation is more effective. For example, Jenkins-Smith & Kunreuther (2001) concluded that compensation measures that were viewed as more appropriate for all four studied facilities (prison, landfill, incinerator, and nuclear waste repository) were supportive to community services or to those adversely affected or physically affected (property value guarantees and medical costs). Direct payments or tax rebates and free garbage collection were ranked as less favourable. Sjoberg and Drottz-Sjoberg (2001), who propose that nuclear power is more readily perceived as a general or political issue rather than a personal one, admit that “compensation in general terms, to a community, may therefore be more acceptable than personal compensation” (p. 95). Aside from economic incentives, Bacot et al. (1994) note that operation incentives can also be employed. The latter include providing a formal possibility to members of the public for oversight or establishing a local committee that can regularly inspect the disposal facility (with the power to close down the facility).

Lawrence (1996) points out that the provision of monetary compensation may not be effective unless coupled with additional local benefits. Monetary compensation is not often effective because of the “Bribe Effect” it produces (Claro, 2007; Schively, 2007; Sjoberg & Drottz-Sjoberg, 2001). Individuals may not

¹⁶Studied compensation measures included: large grants to local government, free garbage pickup, tax rebates to residents, compensation for property value losses, reimbursement for new public services, paying medical costs for health effects from facility, trust fund for harm to future generations, and new special services to meet community needs.

always feel comfortable while accepting financial compensation for something that they consider not favourable for their community (Claro, 2007). While studying the public response to the proposal to build a nuclear waste repository in Sweden, Sjoberg and Drottz-Sjoberg (2001) reveal that the majority of residents were unwilling to accept economic compensation and often considered such a proposal to be an insult or bribe. Authors explain that such an attitude could have been caused by the consideration that accepting compensation would mean admitting a real risk. Schively (2007) explains that the public may consider monetary compensation as a bribe, especially if the siting process is perceived as unfair. However, Bacot et al. (1994) distinguish between a bribe and an economic incentive by explaining that a bribe is an illegal act, “questionable and subversive”, while “incentives are socially accepted activities based on community standards” (p. 231).

The other reason for rejecting monetary compensation is what Claro (2007) calls the “crowding-out effect” (p. 191): when people act not only to pursue monetary gains, but out of their civic duty and public spirit. The latter possibility may be eliminated by accepting financial compensation. Therefore, public goods compensation proves to be associated with lower moral costs by the community members and consequently reduces both the bribe effect and crowding-out effect. Claro (2007) concludes that the effectiveness of public good compensation compared to monetary compensation indicates that public views “environmental goods in term of equality matching relations, and not in terms of market pricing or communal sharing relations” (p. 202). In this explanation, equality matching refers to the public value of justice and equal distribution of benefits, communal sharing implies that the goods are collectively owned and people do not regard individual identities, and finally, market pricing is based on the economically rational behaviour by an individual (Claro, 2007). This conclusion links closely to the conclusion by Wolsink and Davilee (2009) that individuals are not primarily motivated by selfish, market-oriented, and rational interests, but rather by the notions of justice and fairness of decision-making process.

2.4.2.2.1 Analytical frameworks pertinent to the notion of equity

Among the attempts to provide a comprehensive framework of public acceptability of unwanted facilities, two studies are of particular interest to this discussion. The conceptual framework developed by Wolfe et al. (2002) is called the Public Acceptability of Controversial Technologies (PACT). PACT focuses on hazardous waste remediation technologies and aims to provide an explanatory framework for understanding social acceptability of controversial technologies. Wolfe et al. (2002) explain that they consider acceptability as a continuum and not as a dichotomy, and refer to the degree of acceptability as “willingness to negotiate” (p. 140). The continuum of acceptability is influenced by a set of attributes which are unified in three dimensions – constituent dimension, technology dimension, and context dimension. Constituent dimension unifies motivations, values, and strategies of participating individuals or groups. Technology dimension relates to

technologies under consideration and their characteristics (e.g. technical parameters, potential harm to human health and the environment, and predictability of the technology). Context dimension includes physical context (e.g. initial state of the site and its contamination profile), social context, and institutional context. The PACT framework provides a comparatively broader view of social acceptability and encompasses a wide range of pertinent issues. More importantly, PACT introduces the context dimension – a topic that enjoyed relatively less attention in the literature on siting. Despite its merits, however, the PACT framework does not acknowledge equity as one of the determinants of social acceptability of controversial technologies. Although Wolfe et al. (2002) discuss the importance of dialogue among parties, the identified three dimensions of the PACT framework focus mainly on the final selection of the technology rather than the process of the selection itself. Therefore, the procedural aspect of decision-making enjoys less attention in the proposed framework. The latter may be caused by the overall aim of the PACT itself – this framework is meant to assess social acceptability of controversial remediation tools for site-specific hazardous waste clean-up. PACT was not developed to focus on the planning processes of controversial infrastructure projects.

The second framework, the Facility Siting Credo (FSC), was developed in 1990 by Howard Kunreuther, Lawrence Susskind, and Thomas D. Aarts and was based on the outcomes of the National Workshop on Facility Siting (Kunreuther, Susskind & Aarts, 1991). The document aims to provide guidelines for siting initiatives. In a later article Kunreuther et al. (1993) grouped the main principles of the FSC under Procedural Steps and Desired Outcomes:

Procedural Steps

- Institute a broad based participatory process
- Seek consensus
- Work to develop trust
- Seek acceptable sites through a voluntary process
- Consider a multiple competitive siting process (assuming that multiple acceptable volunteer sites are found)
- Set realistic timelines (EIA)
- Keep multiple options open at all times

Desired Outcomes

- Choose the solution that best addresses the problem (from different alternatives) (EIA)
- Guarantee that stringent safety standards will be met
- Fully address all of the negative aspects of the facility (mitigation measures) (EIA)
- Make the host community better off
- Use contingent agreement (EIA)

- Achieve agreement that the status quo is unacceptable (agree that the facility is needed)
- Work for geographic fairness (consider cumulative impacts) (SEA)

Although the FSC is possibly the most comprehensive guiding instrument for siting processes, it is not without its faults. Since the first publication of the Credo in 1990, some of the principles have become institutionalized in the planning process; i.e., they are no longer dependent on the good will of a proponent, but rather represent a legal requirement. For example, the current Environmental Impact Assessment processes include the requirement to consider various alternatives and choose the most suitable one, propose mitigation measures, and form contingency plans. In addition, the timing of the formal steps of the Environmental Assessment is regulated in the corresponding legislation. As for the geographic fairness, the Strategic Environmental Assessment gives the possibility of considering cumulative impacts of proposed developments (see Section 5.7). Another point from the Facility Siting Credo that needs clarification is the desire to achieve agreement that the status quo is unacceptable. In the case of municipal solid waste, different parties agree that a waste management facility is needed. In most cases, municipalities experience (or are expected to experience in the near future) the shortage of waste disposal capacity and the need to find solutions is obvious. Therefore, the issue is not about coming to an agreement regarding the status quo, but about different waste management alternatives and their combinations that can be pursued by the municipality.

The two frameworks along with a significant amount of the reviewed literature on siting focus on hazardous and nuclear waste management facilities. This trend applies to the studies of public acceptance of waste management facilities in the Canadian context that mostly refer to the successful siting experiences for hazardous waste disposal facilities in the Canadian provinces (Rabe, 1992; Heiman, 1990). Rabe (1992) studied three successful siting cases in Alberta, Manitoba, and Quebec and concluded that the siting process succeeded due to extensive public participation, introduction of a compensation package, and building strong partnerships between the public and private organisations as well as between the local and provincial governments. In addition, hazardous waste siting issues were analysed within the larger framework of the hazardous waste management strategy that also included waste reduction and recycling initiatives. Lastly, the provinces introduced regulations on the export and import of hazardous waste. Kuhn and Ballard (1998) also present siting cases for hazardous waste treatment facilities from Manitoba and Alberta and refer to the decision-making process as an “open approach” (p. 533). The decentralisation of decision-making and extensive public participation are named to be the primary factors for the successful outcome of the siting efforts (Kuhn and Ballard, 1998). After presenting the detailed description of the siting process of hazardous waste treatment facility in Alberta, McQuaid-Cook and Simons (1989) and Heiman (1990) offer a similar conclusion. According to the authors, “Alberta’s program is unique in that the public was involved from the outset and played a major role in the decision-making process” (McQuaid-Cook & Simons, 1989, p. 219).

The major part of the literature on public acceptance of municipal solid waste disposal facilities in Canada dates back to the 1980s and mainly includes conference proceedings such as the 8th Canadian Waste Management Conference in Halifax in 1986 and the symposium “Municipal solid waste management. Making decisions in the face of uncertainty” held in Waterloo in 1990. Baxter et al. (1999) investigate the case of siting non-hazardous waste landfills in Caledon, Peel Region, Ontario from the perspective of public trust, equity, and public participation. The article concludes that the siting principles of trust, equity, and public participation, presented as the reinforcing factors for the public consensus building and successful siting procedure, were not achieved. Moreover, the failure to succeed in one direction adversely affected the success of the other principles. For example, the absence of trust between the public and the agencies adversely affected the equity dimension. In addition, the siting process was believed to be excessively “constrained by legislation and lacking the flexibility to overcome siting inertia” (Baxter et al., 1999, p. 521-522).

The section explored public opposition phenomenon towards waste management facilities by focusing on NIMBY sentiments and the notion of equity. The conventional definition of the NIMBY syndrome that is primarily concerned with the selfish motives of public opposing any facility nearby their residence has been challenged for being narrowly defined and ignorant of more complex motives behind public opposition. Over the last two decades, the notions of equity and justice as the crucial elements in formulating public stances entered the scholarly discourse. Of particular importance to this study was the distinction made between distributional and procedural equity and different underlying elements. This chapter critically analysed academic literature pertinent to equity discussions including the existing frameworks that attempt to unify different elements of environmental equity. As a result, the areas that require further research were identified and are presented in the next section.

2.5 Gaps in the literature

The above discussion revealed the main areas where the literature needs further clarification. The identified knowledge gaps relate to the notion of equity, contextual elements, and application of equity considerations towards planning municipal waste facilities.

The topic of public opposition towards locally unacceptable land uses, including waste management facilities, is well-explored from different perspectives. While studies of the self-centred motives for public opposition and corresponding mitigations measures such as compensation schemes were the dominant topic of the discourse during the 1980s, the value dimension of the problem emerged as one of the leading themes during the 1990s. The latter refers to the introduction of such parameters as environmental fairness, justice, and equity during the planning and decision-making process and their effects on public stances. However, the

investigations of equity have been mostly limited to locational issues and siting discourse (Carr, 1996; Reams & Templet, 1996; Kunreuther & Easterling, 1996; Chung et al., 2008; Lara-Valencia et al., 2009; Jenkins-Smith & Kunreuther, 2001; Atlas, 2002; Llurdes et al., 2003; Schively, 2007; Lidskog, 2005). The equity concept should be considered more broadly encompassing not only distributional issues, but also questions of outcome (aside from the siting) and planning process. Calls to expand the definition of equity and provide its more in-depth examination have been made (Lake, 1996).

Certain attempts have been made to consolidate the elements of equity in one framework. However, broader discussion that would equally acknowledge distributional and procedural equity is needed. This calls for the development of a comprehensive and updated conceptual framework that would delineate the notions of distributional and procedural equity and distinguish its key elements, particularly regarding planning controversial waste management facilities.

The existing studies that refer to the equity dimension of the problem fail to explore the community context and its effects on the overall planning process. Elliott et al. (2004) observe that compared to the determinants of public concern, the role of the community context in formulating public stances towards waste disposal facilities is less known. In addition, the existing academic discussion does not explore the trade-offs between the achievement of the ideally charged notion of equity and its practical implementation in terms of financial and time requirements.

The literature is limited on the issue of equity relevant to the municipal solid waste disposal facilities such as landfills and thermal treatment plants and that target the Canadian realm. In general, the relative scarcity of the literature that concerns public acceptability of waste management facilities for municipal solid waste should be noted. Although an array of common issues can be identified for planning hazardous, nuclear, and municipal waste management facilities, it is important to analyse the differences among various types of waste that could emerge during planning waste management facilities, particularly with regard to the equity dimension of the process.

2.6 Analytical framework

As part of this research, an analytical framework was developed based on the identified knowledge gaps and objectives of this thesis.

In their article “Models for the evaluation of public participation programmes”, Sewell and Phillips (1979) propose a framework to evaluate the effectiveness of public participation process. The proposed analytical framework is meant to fill the gap created by the lack of the objective mechanisms to evaluate methods and levels of public participation.

The proposed framework consists of three parameters: “a high degree of citizen involvement, a high degree of equity among the public, and high cost efficiency for the agency” (p. 354). These parameters represent the

desired objective of any public participation process. However, the feasibility of achieving all three parameters to the same extent is doubtful. Therefore, the framework introduces the notion of *trade-offs* between various parameters – since it is not possible to succeed in all three dimensions to the same extent, it is necessary to make a choice and “compromise positions that may be reached” (Sewell &Phillips, 1979, p. 354) (see Figure 3).

The “degree of citizen involvement” parameter relates to the process of public involvement both in terms of the number of participants and in terms of the quality or degree of their involvement. Therefore, different participation mechanisms and techniques are important elements of this area as they largely define how effective the public participation process will be.

The second parameter of the framework is the degree of the achieved equity that is defined “as the relative degree of representation, that is, the extent to which all potential opinions and values were heard” (p. 354). The “equity” parameter implies that the interested parties are given equal opportunity to express their opinions which are equally considered. However, because of the practical constraints (e.g. the need for excessive labour and time resources), a high degree of equity can be considered to be more of an ideal rather than a real possibility (Warriner, 1997).

The final parameter of the framework is the efficiency of participation which refers to the “amount of time, personnel and other agency resources required to reach a given decision” (Sewell &Phillips, 1979, p. 354). The “time and cost efficiency” parameter is an important aspect of the siting process. Baxter et al. (1999) note that the siting process of environmentally noxious facilities such as landfills and incinerators requires extensive funds and a long period of time; however, they often fail to acquire public acceptance and reach a final decision. As Gallagher et al. (2008) note, the siting procedure for waste disposal infrastructure is lengthy and expensive, “which in turn increases the private and social costs of providing final waste disposal infrastructure deemed necessary by national and regional waste management planning” (p. 233).

The need for trade-offs is especially evident when it comes to the cost of the process, as higher involvement and equity require high expenses both in terms of funds, time, and other administrative resources. Mazmanian and Morell (1990) point out that making trade-offs between the number of people participating in the decision-making process and the corresponding costs is unavoidable. Smith and McDonough (2001) note that some of the principles of fair decision-making process are hard to implement due to the excessive requirements of financial and human resources.

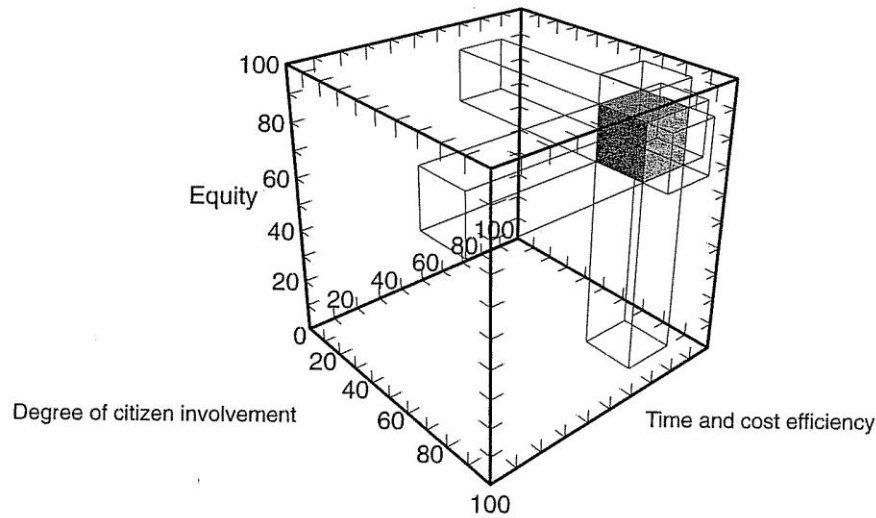


Figure 3 Trade-offs between degree of citizen involvement, equity, and efficiency

Source: Sewell and Phillips, 1979, p. 335

The above framework was modified based on the purpose of the current research and the consulted literature on planning waste management facilities. The efficiency parameter was left intact. However, two other parameters of involvement and equity require further formulation. The degree of citizen involvement is closely linked to the participation *process*. Therefore, it can be alternatively referred to as the *procedural equity* domain. The equity parameter of the original framework refers to the degree of involvement of all interested parties, which is still consistent with the procedural aspect of the issue. Therefore, the equity parameter was replaced by the *substantive equity* domain that does not refer to the process but to the final outcome. At this point, it is worthy to reiterate the explanation of procedural and substantive equity by Lawrence (1996) as it explains very well the meaning of these concepts in the adapted framework: “procedural equity pertains to fairness in the planning process, especially for groups and interests traditionally under-represented in planning and decision making and substantive equity is concerned with the fair distribution of facilities and benefits and costs among stakeholders and over space” (p. 167-168). The substantive equity unifies what Baxter et al. (1999) refer to as “social equity” and “spatial equity” (p. 504). Consequently, the adapted framework consists of the three different domains:

- 1) *Substantive equity* implies the fair decision (fair outcome).
- 2) *Procedural equity* refers to the fair planning and decision-making process.
- 3) *Efficiency* refers to the funds, human and administrative resources, and time required during the planning process.

The other alteration of the proposed framework is the addition of the *context* domain. Each siting process is embedded in the existing socio-cultural, economic, legal, and political context. Lawrence (1996) and Lober

(1995) note that past experiences influence the siting process. The importance of context is emphasized by Gross (2008) who notes that the social problems are embedded within its socio-cultural context, corresponding patterns, procedures, and rules. During the siting discourse, the community context becomes of particular importance. As Lober (1995) notes, “communities differ, as do the historical events and landscape, all of which are likely to shape public response to a siting effort” (p. 514).

The analytical framework is organized around four broad domains of substantive equity, procedural equity, efficiency, and contextual elements. These domains are broken down into corresponding themes and more specific elements (see Table 4). The themes and elements that fall under the three domains of the proposed framework, as well as under the contextual elements, were distinguished based on the conducted literature review (presented in the previous sections). Undoubtedly, all of the concepts used in the analytical framework are quite broad and embody a number of specific themes and topic areas. However, the current framework is mainly focused on the planning process of waste disposal facilities with a particular emphasis on thermal treatment plants.

Table 4 Summary of the themes and elements that fall under the domains of substantive and procedural equity, efficiency, and context

Domain	Theme	Element	Reference/Source
SUBSTANTIVE EQUITY	<i>Desired outcome</i>	Outcome that is favourable for community members, outcome that is perceived fair in relation to future generations, and outcome that will not have negative impact on the natural environment and human health	Smith & McDonough, 2001; Gerard, 1994; Kasperson & Dow, 1991
		Spatial distribution of facilities	Baxter et al., 1999; Lawrence, 1996
	<i>Compensation</i>	The role and effectiveness of compensation schemes	Gallagher et al., 2008; Kikuchi & Gerardo, 2009; Schively, 2007; Lidskog, 1998; Luloff et al., 1998; Bacot et al., 1994; Jenkins-Smith & Kunreuther, 2001; Sjoberg & Drottz-Sjoberg, 2001; Chung et al., 2008; Rabe, 1992; Lawrence, 1996; Petts, 1994b; Susskind, 1985
		Financial vs. in-kind or public good compensation	Claro, 2007; Jenkins-Smith & Kunreuther, 2001; Sjoberg & Drottz-Sjoberg, 2001

Domain	Theme	Element	Reference/Source
PROCEDURAL EQUITY	<i>Representation (broad involvement)</i>	Early and extensive public involvement	Rabe, 1992; Joos et al., 1999; Gross, 2008; Lahdelma et al., 2000; Lawrence, 1996; Smith & McDonough, 2001
	<i>Voice</i>	Participation in decision-making process	Smith & McDonough, 2001; Gross, 2008; Webler & Tuler, 2000; Illsley, 2003
	<i>Consideration</i>	Opportunity for concerns and issues to be raised and responded to	Smith & McDonough, 2001; Gross, 2008
	<i>Environmental mediation</i>	Conflict resolution/consensus building	Lawrence, 1996
		Transparency of decision-making and decision-execution (including financial transparency)	Joos et al., 1999
		Impartiality and trustworthiness of decision-making authority	Gross, 2008; Petts, 1994b; Lober, 1995; Baxter et al., 1999; Hunter & Leyden, 1995; Ibitayo & Pijawka, 1999; Bacot et al., 1994
	<i>Public relations</i>	Community relations – the establishment and maintenance of a general awareness in the community about waste management issues	Joos et al, 1999
		Risk communication (any purposeful exchange of information about health or environmental risks between interested parties)	Petts, 1992; Petts, 1994b; Covello, 1991
	<i>Information provision</i>	Possibility of receiving adequate information	Besley, 2010; Gross, 2008; Illsley, 2003; Petts, 1994b
EFFICIENCY	<i>Efficiency</i>	Financial expenses Time required (time-consuming process) Personnel and other agency resources	Sewell & Phillips, 1979; Warriner, 1997; Baxter et al., 1999; Gallagher et al., 2008
CONTEXT	<i>Perceived risk</i>	Perceived risk in relation to environmental and health impacts, as well as uncertainty about safety, regulation, and the nature of the waste stream	Elliott, 1998; Petts, 1994b; Sjoberg & Drottz Sjoberg, 2001
	<i>Legal and institutional arrangements</i>	Pertinent legal and institutional structures, including overall waste management strategy	Rabe, 1992; Wolsink & Devilee, 2009
	<i>Previous experience</i>	Experience of hosting and managing waste disposal facilities	Gallagher et al., 2008 ; Lawrence, 1996 ; Petts, 1994b

Domain	Theme	Element	Reference/Source
	<i>Property value</i>	Perception about the changes in property value	Gallagher et al., 2008 ; Petts, 1994b
	<i>Political involvement</i>	Participation of elected representatives	Lawrence, 1996

Chapter 3

Methodology

This chapter discusses the ontological, epistemological, and methodological traditions that inform this research. The chapter opens with an introduction of critical realism as the philosophical worldview adopted in this study, including its definition and basic considerations. Section 3.2 presents applied research methods including case study research, interviews, and document analysis. Further, the approach employed to analyse gathered data is described. Lastly, the chapter discusses identified limitations of the research and evaluates the validity of the findings.

3.1 Scientific research paradigm

3.1.1 Ontological, epistemological, and methodological perspectives of critical realism

According to the critical realism philosophy, reality exists independently from the researcher's knowledge (Sayer, 2004a; Ayers, 2011). However, independence does not imply a simple and straightforward access to the real world, but rather a more complex relationship (Sayer, 2004b). Critical realism distinguishes between transitive and intransitive dimensions of knowledge (Ayers, 2011; Sayer, 2004a). Transitive objects are theories and explanations of events – knowledge constructed by researcher and therefore “necessarily partial, imperfect, and subject to revision” (Ayers, 2011, p. 347). Intransitive objects are those physical processes or social phenomenon that researchers study; therefore, they “exist irrespective of our awareness of them and without regard to our transitive knowledge of them” (Ayers, 2011, p. 347; Sayer, 2004a). As Cruickshank (2010) explains, intransitive domain “pertains to reality” and the transitive domain pertains “to our theories about reality” (p. 583). The distinction between transitive and intransitive dimensions of knowledge explains the ontological perspective of the critical realism - there is a reality “to discover even though it is only imperfectly apprehensible” (Healy & Perry, 2000, p. 120).

The assumption that our attempts to explain and present an absolutely accurate picture of reality is deemed to be fallible calls for the critique and further refinement of our theories, conceptual schemes, and propositions (Scott, 2010; Lund, 2005). According to Guba and Lincoln (1994), the term “critical realism” implies that reality should be critically evaluated and examined from as many perspectives as possible in order to approach its maximum possible apprehension. The critical realist aims to study people's perceptions in order to gain “a window on to reality beyond those perceptions” (Healy & Perry,

2000, p. 120). Contrary to the phenomenological approach, perceptions are not studied only for their intrinsic value (Healy & Perry, 2000). For realist researchers reality and perceptions are not the same - there is the reality that is viewed from various perceptions¹⁷ (Perry et al., 1999).

If we recognize one reality having different perspectives, various approaches should be applied to study multiple sides of the reality. This is particularly true for the given research that aimed to reveal the views of different stakeholders involved in the planning process of thermal treatment plants for municipal solid waste. Subsequently, this study attempts to understand meanings assigned to substantive and procedural equity by involved stakeholders. Since “meanings are related to material circumstances and practical contexts” (Sayer, 2004a, p. 15), the case study research is considered particularly pertinent for exploring the phenomenon and situating it within a wider context (Sayer, 2004a; Easton, 2010; Alvesson & Skoldberg, 2009).

The perspective of critical realism stems from the critique of both positivism and phenomenology (Danermark et al., 2002; Ayers, 2011; Yeung, 1997). According to critical realism tradition, the latter are considered to reduce reality “and thus restrict our understanding of the world” (Danermark et al., 2002, p. 8). Whereas positivism and phenomenology present “flat” ontology, critical realism suggests “stratified ontology” (Sayer, 2004a). As Danermark et al. (2002) explain, “the point of departure in critical realism is that the world is structured, differentiated, stratified and changing” (p. 5). Reality is considered to consist of three stratified domains that are hierarchically arranged - mechanisms (domain of Real) generate events (domain of Actual); once events are experienced, they become empirical facts (domain of Empirical) (Danermark et al., 2002; Wuisman, 2005). The domain of real is not accessible to the researcher and should therefore be studied through observing its effects (Ayers, 2011). Critical realism considers actual and empirical to be surface phenomena and is interested in uncovering and testing underlying causal mechanisms existing in the domain of real (Ayers, 2011; Danermark et al., 2002; Wuisman, 2005; Iosifides, 2011). In accordance with the critical realism view, this research aimed to uncover the role of equity in planning processes of thermal treatment plants for municipal solid waste. Therefore, the role of equity can be considered the mechanism in the domain of real, public opposition as the event partially caused by the lack of equity, and public participation processes as the empirical observable facts. In other words, this research explains the event (public opposition) by identifying and defining mechanisms that can contribute towards generating this event (lack of equity). A quotation by Banai (1995) on application

¹⁷As Lincoln and Guba (1985) define, “a perception is a partial, incomplete view of something that is nevertheless real, and capable of different interpretation when seen from different viewpoints. It is partial and incomplete only because each perception yields experience of only a limited number of *parts* of the whole” (p. 83).

of critical realism in urban and regional studies possibly best describes the attempt of this research to understand the role of equity in shaping public opposition:

There is the tendency of empirical models to describe events rather than processes or causal mechanisms which produce events. A realist account, in contrast, seeks to reveal causation, not just the manifestation of urban and regional development phenomena. This perspective calls for accountability to the motivations, intentions, and actions of actors, agents, or participants in the context of urban and regional development processes, not just with the outcome of their actions. (p. 570)

The fundamental assertion of critical realism about stratified reality leads to the realist interpretation of causation. As Sayer (2004a) explains, “for realists, causation is not understood on the model of regular successions of events...what causes something to happen has nothing to do with the number of times we have observed it happening. Explanation depends instead on identifying causal mechanisms and how they work, and discovering if they have been activated and under what conditions” (p. 14). Consistent regularities can occur in closed systems where both intrinsic conditions (the nature of the object) and extrinsic conditions (external to the object) are constant. Such an environment can be produced artificially (in laboratory-style experiments); however, they hardly occur in the social world (Sayer, 2004; Morais, 2011). Critical realism is more concerned with the complexity of social phenomena; therefore, causal explanations are seen to exist on different levels and be contextual and emergent. As a result, instead of seeking exact relations between cause and effect and consequent predictable patterns, critical realism aims to generate tendencies (Alvesson & Skoldberg, 2009).

In order to uncover the causal mechanisms in the domain of real that generate events in the domain of empirical, critical realists use the mode of inference known as “retroduction”. The main rationale behind offering retroduction is that two other modes of inference – deduction and induction – are concerned with the domain of “empirical” (events) and do not seek to uncover the generative mechanisms (Morais, 2011). In critical realism literature, retroduction is believed to consist of the following steps: 1) observing phenomenon or event in the domain of actual; 2) building a hypothetical model of the structures and causal powers in the domain of real (explanation of the identified event or phenomenon); and 3) testing the proposed explanation in the domain of empirical (Ayers, 2011). This research followed the above steps by a) identifying and studying the phenomenon of public opposition towards thermal treatment plants for municipal solid waste; b) building a framework that aims to explain the role and nature of equity; and c) testing the proposed framework on selected case studies. By applying the retroduction approach, the research moved from the description of the phenomenon to the description of something that causes this phenomenon or is a condition for it to occur (Yeung, 1997; Morais, 2011).

Instead of being either value-free as positivists or value-laden as phenomenologists, critical realists are value-aware. As mentioned above, critical realists recognize the existence of a real world that is not fully apprehensible and that is viewed from multiple perspectives (Healy & Perry, 2000). As Healey and Perry (2000) explain, "...participant's perception is not reality as constructivism and critical theory would suggest. Rather, a participant's perception for realism is a window to reality through which a picture of reality can be triangulated with other perception" (p. 123). Thus, in order to comprehend reality, its various perceptions are studied through the triangulation of various data sources (Healy & Perry, 2000).

When discussing the realist perspective of research methods, Sayer (2004a) distinguishes between extensive and intensive research designs. Extensive research is concerned with portraying "how extensive certain phenomena and patterns are in a population" (Sayer, 2004a, p. 20) and therefore seeks out regularity and quantitative relations among variables. Intensive research, however, attempts to develop causal explanation; that is, answer the question on "what makes things happen in specific cases" (Sayer, 2004a, p. 20) and to "interpret meanings in context" (Sayer, 2004a, p. 21). Extensive research mainly employs quantitative research methods including large-scale surveys, formal questionnaires, and statistical analyses, whereas intensive research is associated with qualitative methods such as interviews, study of individual agents in their causal contexts, qualitative analysis, and ethnography (Sayer, 2004a, p. 20-21). Sayer (2004a) and Yeung (1997) suggest that statistical explanations do not provide explanations of deep generative powers and structures, but rather produce "quantitative descriptions of formal associations" (Sayer, 2004a, p. 22). Qualitative research is increasingly regarded as a methodology that enables to explore multidisciplinary and complex phenomenon (Morais, 2011). Therefore, intensive research design and qualitative methods are more readily associated with the critical realism perspective.

Case study research as a qualitative strategy has been regarded particularly pertinent for critical realist inquiry, as it enables the investigation of underlying mechanisms and generation of casual explanations (Alvesson & Skoldberg, 2009; Morais, 2011). As Morais (2011) explains, "case studies may provide explanatory insights, especially when phenomena are dynamic, systematic and multidisciplinary" (p. 81). This thesis explored equity considerations as a mechanism generating public opposition towards thermal treatment plants. Therefore, case study research enabled an in-depth investigation of planning processes, including the domains of substantive and procedural equity along with the broader context within which the cases unfolded.

While discussing methodological applications of critical realism as ontology, it should be mentioned that critical realism is, first and foremost, a philosophical movement. Critical realism is primarily concerned with ontological and epistemological questions and its application in the empirical research has been a relatively new tendency (Morais, 2011). This attempt to adopt a critical realism approach towards

studying planning processes for thermal treatment plants can contribute towards expanding the discussion on how to translate critical realism ontology into methodological steps.

3.2 Research methods

3.2.1 Case study research

A case study research was employed to explore answers on the posed research questions. As Stake (2003) explains, “case studies are of value for refining theory and suggesting complexities for further investigation, as well as helping to establish the limits of generalizability” (p. 156). In addition, case study research gives the possibility to “provide a richly detailed ‘portrait’” of a selected social phenomenon since it enables one to gather and analyse comprehensive and in-depth information about the chosen case (Hakim, 2000, p. 59; Patton, 2002). In social sciences a predictive theory may hardly exist. Instead of context-independent and general theory, social sciences offer context-bound and concrete knowledge; thus, case studies are best suited to generate such knowledge (Flyvbjerg, 2004).

Case studies choose *what* to study by employing selected methods (Stake, 2000). According to Stake(2003), “the case is a ‘bounded system’” (p. 135). Therefore, case delineation requires clear identification of the subject of study and the factors, phenomenon, and events that will be within the scope of the case research. In the context of this research, “the case” represents the planning process for thermal treatment facilities for the MSW and particularly focuses on the equity dimension of the process.

Therefore, the case study research made it possible to investigate the role of the equity dimension in formulating public stances towards thermal treatment facilities by employing the example of three planning processes. In addition, each case study enabled the researcher to explore and demonstrate different perspectives of involved parties, especially the two major groups of actors - proponents and authorities who were in favour of the project, and the public which was often reluctant or severely opposed to thermal treatment option. The selected cases explored past examples as well as an on-going planning process. The following cases have been investigated:

CASE I: Halton region thermal treatment project, Ontario

CASE II: Niagara-Hamilton thermal treatment project, Ontario

CASE III: Durham-York thermal treatment project, Ontario

The cases aimed to explore one and the same phenomenon; however, their characteristics, context, and process outcomes were different. Case I and Case II explored the planning process that aimed to introduce the thermal treatment plant in Halton region and the Niagara-Hamilton region respectively, but failed to do so. Case III focused on the on-going process in Durham-York region where the two municipalities have partnered to construct a mass-burn incineration. All three cases studied the planning process when the proponent of the project is a public body – a region or a municipality.

The selected case studies do not represent all cases of planning thermal treatment plants in Ontario that took place within the last two decades. As was mentioned in the beginning of this thesis, thermal treatment plants have not been widely constructed in North America. Therefore, given a limited number of planning efforts to introduce thermal treatment practice in Ontario, the three cases studied cover the major developments in the field and present the recent trends and tendencies.

Stake (2003) proposes the following classification of case studies:

1. *Intrinsic case study* is carried out because of the interest in the case itself. Such a case is considered to be particular and original. The primary purpose is not to build a theory or understand a wider phenomenon, but rather to concentrate and comprehend one particular case.
2. *Instrumental case study* is employed to provide a better insight into a certain issue.
3. *Collective case study* is employed to better comprehend the phenomenon. A number of cases are studied simultaneously to help a researcher to understand and theorise the larger collection of cases. In fact, collective case study is an instrumental study applied to several cases.

As Stake (2003) notes, often it is difficult to delineate the border between intrinsic and instrumental cases because the researcher is interested in both particular and general issues. However, in the given research, the primary purpose of conducting case studies was to gain better insight into the subject of the research. Thus, these case studies most closely resemble the instrumental case study category. In addition, for critical realist tradition, instrumental case studies are deemed most suitable as they give the possibility to investigate causal mechanisms, rather than concentrate on subjective experiences or accounts (Morais, 2011). Since the study investigated not one but a few cases that are dissimilar but share common characteristics (planning thermal treatment facilities for MSW) and consequently aim to comprehend the larger phenomenon, it is possible to categorise the current approach as collective case studies as well.

3.2.2 Interviews

The purpose of qualitative interviewing is to understand the other person's perspective (Patton, 2002). Interviewing was the central method of this study to gather primary data and gain insight into the planning process. The focus of the research was to explore various perceptions of the substantive and

procedural equity by the actors. Different circumstances, personal and professional experiences, or other subjective reasons largely frame public stances about the equity of the planning process and its outcome. Consequently, qualitative interviews represent the best possible means to explore these issues.

An interview guide with potential questions was developed based on the literature review on substantive and procedural equity, efficiency, and contextual elements (See Appendix A). Although the same lines of inquiry were touched with different informants, the interviewer was free to explore more on certain questions. The interviews aimed to be more conversational with the researcher setting the general direction (according to the interview guide) and being interested in hearing informants' viewpoints and understanding informants' attitudes (Neuman, 1997; Babbie, 2001; Patton, 2002; Hakim, 2000; Marshal & Rossman, 1995).

In total, 18 interviews with the representatives of the regions and municipalities, consultation firms, and environmental and advocacy organizations were conducted between October 2009 and April 2010. The interviewees were selected through purposeful sampling based on their affiliation to the researched cases or their competence in the waste management field. The intention was to capture the perspectives of all the main actors - especially those positioning themselves on opposite sides of the siting discourse. As Patton (2002) notes, the purpose of interviewing is "to allow us to enter into the other person's perspective" (341). In addition to the initial list of informants, the snowball or chain sampling method was also used. The latter refers to the situation when an informant helps to identify other interviewees, thus helping to build up a chain of interview participants (Patton, 2002). It may be argued that the extensive use of snowball sampling method may result in more subjective and biased answers which result in not representing equally different viewpoints. However, during this research it was ensured that approximately the same number of informants was interviewed from both sides (e.g. those in favour and those against the project). In addition, the snowball sampling method was used to recruit a small number of informants. Most interviewees were identified by the researcher before commencing the primary data collection phase.

Most interviews were conducted over the telephone because often the interviewees preferred to participate through telephone interviews and also because sometimes the author was unable to travel to meet the informants. Although the large number of telephone interviews could be considered a limitation of this study because of the lack of the personal contact, the interviews were lengthy (about an hour or more). This length enabled the researcher to build the trust of the interviewees and explore the issues in-depth.

When the informants granted permission, their interviews were recorded and later transcribed. Additionally, during every interview the author took detailed notes which proved to be very useful during data analysis stage.

In order to ensure the anonymity of the informants, neither their names nor any other potentially identifying information (e.g. name of the organization) were used while writing the thesis. In the following chapters that describe case studies, the informants are identified solely by their affiliation to the type of organization (e.g. environmental organization, non-government organization, or public agency) as well as the unique code that was assigned to them while writing the thesis (for example, Informant 01 [I01]).

3.2.3 Document analysis

The interviews were complemented by a review of documents pertinent to the case studies. The analysis of the documents that are produced “in the course of everyday events” is helpful in understanding the setting and context as well as the approaches and views of the actors. As Patton (2002) notes, records and documents “constitute a particularly rich source of information about many organizations and programs” (p. 293). Similarly, Travers (2001) observes that “much of the interaction that takes place in modern society is mediated by different kinds of texts” (p. 5). Hakim (2000) notes that “records and documents, albeit incomplete accounts, are part of the reality being studied, rather than being regarded as a poor substitute for data that would ideally be obtained in other way” (p. 49). While conducting document analysis, the researcher may face some difficulties such as missing data or restricted access to certain documents, accuracy of documents, and difficulty to link documents to other sources of data such as interviews and observations (Hakim, 2000; Patton, 2002).

The documents were studied based on the content analysis method. The latter implies the investigation of the raw written material based on the posed research questions in order to discover and document the pattern and to investigate where the largest emphasis lies. The main advantage of the content analysis is that it allows the researcher to conduct the document research “without disturbing the setting in any way” (Marshall & Rossman, 1995, p. 86).

The document analysis began prior to conduction of interviews and continued in parallel with interviewing. The major share of the studied documents consisted of the official documents produced during the planning process. Analysed documents included environmental assessment reports, meeting minutes, reports on public consultations, official media releases, and official agreements (e.g. between the regions to conduct a joint study). All of these documents are part of the official, publicly available record and can be found on the websites of the corresponding regions and municipalities. The official

documents provided reliable records of the activities and events that constituted the planning process for a given case. Therefore, the document analysis proved to be particularly useful in restoring the chronological sequence of the planning processes of the studied cases and for revealing the main participants. The document analysis also helped in preparing for the interviewing stage by enabling better understanding of the past planning processes and the relevant contexts. However, it should be noted that the studied documents were necessary but not sufficient to understanding the undercurrents of the planning processes. The interviews were employed to fill this gap.

Aside from the official documents, newspaper articles were also researched. The newspaper articles that covered the developments of the selected cases provided useful details and interesting quotations that were used in the case studies. In addition, the wide coverage of the case studies in the printed media proved their highly controversial nature and public interest towards planning processes of thermal treatment plants.

3.2.4 Data analysis

Gathered qualitative data were content analysed in order to detect the main patterns and themes. As Patton (2002) explains, “content analysis is used to refer to any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings” (p. 453). After the main patterns and themes were identified, they were analysed in order to provide answers to the posed research questions. The recognition of the main patterns and themes was conducted with the guidance of the topics already identified in the relevant literature (Table 4). Thus, the data analysis included the following stages:

1. Identification of the main topic categories
2. Recognition of the main patterns and themes based on the identified topics
3. Analysis (interpretation¹⁸) of the identified patterns and themes

3.2.5 Limitations

Focusing on particulars and experiencing difficulty in generalising outcomes are often cited among the main constraints of the case study approach. Case study research gives the possibility of investigating a limited amount of context-dependent cases in a much more detailed fashion, providing “thick description” of its context and issues (Flyvbjerg, 2004; Stake, 2003, p. 140). However, Flyvbjerg (2004)

¹⁸As Patton (2002) explains, “interpretation means attaching significance to what was found, making sense of findings, offering explanations, drawing conclusions, extrapolating lessons, making inferences, considering meanings, and otherwise imposing order on an unruly but surely patterned world” (p. 480).

argues that one misunderstanding about case study method is that one cannot generalize on the basis of a single case study. Flyvbjerg (2004) proposes to change the assertion that it is impossible to generalize on the basis of a single case as it cannot contribute to scientific development; instead, he proposes acceptance of the following:

One can often generalize on the basis of a single case, and the case study may be central to scientific development via generalization as supplement or alternative to other methods. But formal generalization is overvalued as a source of scientific development, whereas ‘the force of example’ is underestimated. (p. 425)

In his article, Guba (1981) asserts that the criteria that are applied to the rationalistic inquiry should not be used for the naturalistic research, as the latter “has its own set of criteria for adequacy” (p. 88). One of such criterion is called “external validity or generalizability” in rationalistic paradigm (Guba, 1981, p. 80). The generalizability implies that research findings should be context-free and applicable to any context. However, for the case study research that is deeply rooted within the existing context, application of such a criterion for trustworthiness may be misleading.

This thesis treats the issue of generalizability from two perspectives. Firstly, the criterion of “transferability”, when certain transferability is possible between two contexts, is proposed. This thesis did not aim to form universally generalizable truth statements, but rather offered findings “that may be transferred from one context to another depending upon the degree of ‘fit’ between the contexts” (Guba, 1981, p. 81). The presented cases provide rich description of the context that will permit comparison with the other context in which the developed framework or proposed findings may be tested (Guba, 1981) (see Section 6.2 for detailed suggestions on further research). For example, more research is needed to test the developed framework and thesis findings in the cases when projects take place in other countries.

More broadly, given critical realist view of causation and explanation, this generalization can be seen in a new light. Critical realism offers to generalize only transcendental (or unobservable) mechanisms in the domain of real as the existence of closed systems is impossible in the social world. Such generalization is called transfactual generalization and is based on the critical realism tradition to uncover tendencies that may or may not manifest themselves in the empirical domain (Morais, 2011). This thesis aimed to study equity as a mechanism shaping public opposition towards thermal treatment facilities. Consequently, the finding of this thesis regarding the role and nature of equity as one of the mechanisms influencing public opposition can be a subject of transfactual generalization.

The fact that most of the interviews were conducted over telephone could be considered a limitation of the study. Face-to-face interviews are favoured for in-depth investigation of the topic. However, as

explained above, in most cases it was not feasible to conduct personal interviews. Therefore, the significant length of the telephone interviews facilitated exploration of the topics and gave the possibility for the informant to describe the cases and comment extensively.

While studying planning processes, the data gathered through observation could provide a useful insight to the researcher. However, it was not possible to conduct observations, since the public consultation phases were completed in all three cases by the time this research was initiated. Instead, detailed study of the meeting minutes and reports of the public consultations could be considered the mitigation measure addressing this limitation. For example, the detailed reports prepared by the independent facilitator for the public hearings in the Durham-York case were extremely valuable for comprehending the atmosphere in which these meetings were held.

3.2.6 Validity of findings

To ensure the validity and accuracy of gathered data and research findings, the following three approaches were employed:

3.2.6.1 Triangulation

Triangulation implies the use of multiple methods in order “to clarify meaning, verifying the repeatability of an observation or interpretation” (Stake, 2003, p. 148). Triangulation is not equal to validation but is an alternative which displays “multiple, refracted realities simultaneously” (Denzin & Lincoln, 2003, p. 8). Triangulation helps not only to ensure validity and clarity of data and analysis, but also to discover various aspects of the subject under study (Patton, 2002; Denzin & Lincoln, 2003). Triangulation helps “to clarify meaning by identifying different ways the phenomenon is being seen” (Stake, 2000, p. 444). Therefore, the idea of triangulation is in line with the ontological perspective of realism which calls for the investigation of the reality from various perspectives.

According to Patton (2002), there are four types of triangulation used to validate qualitative analysis:

1. Methods triangulation – employing different data collection methods to check the consistency of findings
2. Triangulation of sources – checking out the consistency of different data sources within the same method
3. Analyst triangulation – Undertaking multiple analysis to review findings
4. Theory/perspective triangulation – Using multiple theories or perspectives to interpret data

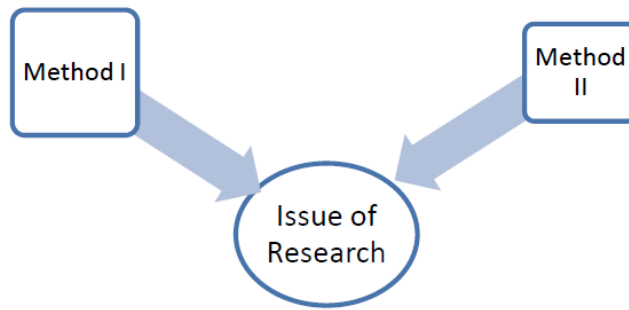


Figure 4 Triangulation of different research methods

Source: Adapted from Flick, 2007, p. 66

For checking the consistency of information and findings and to extend the knowledge of the studied cases, the current research employed triangulation of methods (see Figure 4). As described above, the data were gathered through the detailed study of documents and the conduction of interviews. Consequently, information derived from documents was compared to the data gathered through interviews. In addition, document analysis and interviews enabled studying different aspects of the issue. The documents largely assisted in restoring the chronological order of the planning process. On the other hand, the interviews made it possible to learn the perspectives and viewpoints of different stakeholders. Although in some cases the planning reports and meeting minutes also provided information about the position of the participants, these were more condensed compared to the rich data derived from the interviews.

While drawing the conclusion from the case studies, method triangulation made it possible to compare the consistency of findings from the employed methods. In accordance with Flick's (2007) explanation, the additional knowledge derived from combining methods helped to confirm or validate "the results coming from one method" (p. 73).

3.2.6.2 Detailed description to convey findings

The research presented a comprehensive overview of the existing discussion in the literature regarding public acceptance of thermal treatment facilities for municipal solid waste. The case studies brought additional insight into the issue. Therefore, the reader is able to become acquainted with the rich background and contextual information about the discussed topic (Creswell, 2003). As Patton (2002) notes, "keeping findings in context is a cardinal principle of qualitative analysis" (p. 563). Maxwell (2005) notes that "rich" (p. 10) data can provide a full and representative picture of the reality. By providing the

description of the overall context and the detailed description and analysis of the cases, the study revealed the complexity of the studied phenomenon (Miles & Huberman, 1994).

3.2.6.3 Informant validation and researchers' biases

According to Hakim (2000), one weakness of the case study approach is the possibility that the research conclusions can be largely influenced by a researcher. The subjective viewpoints of a researcher can alter the accuracy of the research findings. Therefore, the researcher should firstly acknowledge his/her biases that can be revealed in the form of pre-dispositions about the studied subject. Possible and existing biases should be made explicit and then addressed in order to minimise their influence on the research findings (Patton, 2002).

By the beginning of the case study research, I acknowledged that my personal biases in this particular study could have been related to the discussion surrounding benefits of introducing large scale thermal treatment facility for municipal solid waste. However, despite my personal stance about this matter, I ensured that the interviewing process, the data analysis, and the formulation of conclusions were not influenced by my subjective considerations. I was guided by the desire to understand fully my informants' views, justifications, and arguments about the researched subject. Therefore, I was able to construct the picture of the reality as viewed from various perspectives that were not filtered through my subjective lenses.

To minimise my personal biases and to ensure the validity of the gathered data, the interviewees were asked to verify the interview transcripts. The data validation was particularly important since the conclusions of the proposed study heavily relied on the conducted interviews; therefore, it was essential to avoid any misinterpretation of the interview data.

Chapter 4

Case Studies

In this chapter, three case studies are presented. Section 4.1 introduces Halton region thermal treatment project, Section 4.2 discusses Niagara-Hamilton thermal treatment project, and lastly, Section 4.3 presents Durham-York thermal treatment project. The first part of each case provides background information about the region and detailed description of the planning process. The second part is dedicated to the analysis of the case and is organized according to the research questions. The discussion in the analytical part of each case is guided by the analytical framework presented in Chapter 2.

4.1 Case Study I – Halton region thermal treatment project

4.1.1 Background information

The Regional Municipality of Halton¹⁹ is located in the southwest part of the Greater Toronto Area (GTA). The Halton region covers the area of 967 square km, has the population of 467 200, and comprises of the local municipalities of Burlington, Halton Hills, Milton and Oakville (The Regional Municipality of Halton, 2009a) (See Figure 5).

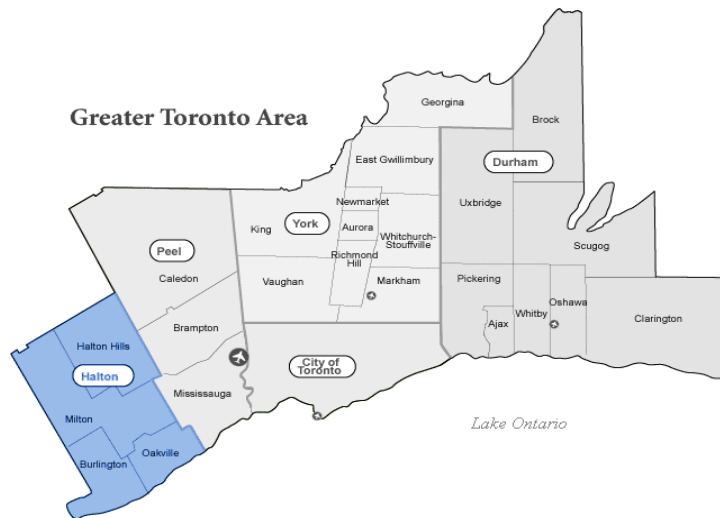


Figure 5 Map of the Halton region

Source: Greater Toronto Marketing Alliance, 2010.

¹⁹Later referred as the Halton region.

Halton Region Waste Management Services employ the following programs for waste collection: Blue Box for recyclables, Green Cart for compostable organics, and bi-weekly collection of the waste refuse. The waste collection scheme was introduced on April 7, 2008 based on a new Region-wide waste collection and processing contract. The major change was the introduction of a new Green Cart program for organics and replacement of a bi-weekly collection of the Blue Box with the weekly collection schedule. On the other hand, the weekly collection program of the garbage was replaced by the by-weekly schedule. The major aim of these changes was to achieve 60 per cent diversion rate and consequently, to extend the life of the landfill by about seven years (from 2023 to 2030) (Halton Region, 2008).

Based on the latest data, the initiatives to enhance waste diversion proved to be effective (see Figure 6). Whereas the diversion rate has remained in the range of 27-42 per cent for the last decade, the data for 2008 reveal the increase of the diversion rate of up to 56.6 per cent²⁰ (The Regional Municipality of Halton, 2009b).

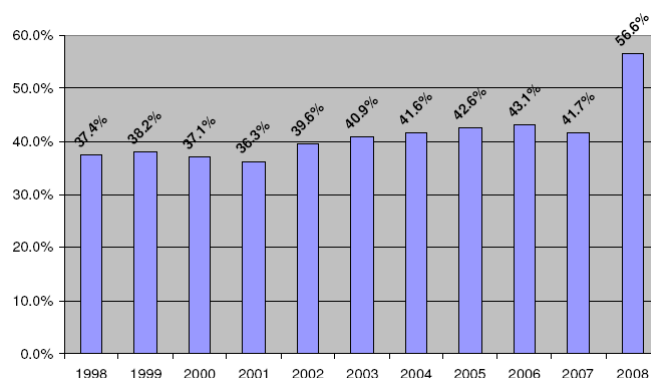


Figure 6 Waste diversion rates in Halton region for 1998-2008

Source: The Regional Municipality of Halton, 2009b

The above initiatives are in accordance with the 2006-2010 Solid Waste Management strategy that was first introduced by the Council in October 2005. The Strategy included the initiatives developed by the Joint Municipal/Regional Waste Management Committee. The latter represents an advisory committee authorized by the Regional Council that consists of the residents and Councillors from the four local municipalities (The Regional Municipality of Halton, 2006).

²⁰ The capital spending for the solid waste management amount CAD 7.3 million that represents 4.1 per cent of the total capital spending of the region in 2008. The operation costs of the waste management services were much higher and amounted CAD 33.0 million in 2008 (that represents 6.9 per cent of the total operational expenditures of the region in 2008). The operational costs covered the collection and disposal expenses of 92,775 tonnes of residential waste, diversion of 121,200 tonnes of residential Blue Box recyclables and organic materials (Halton Region, 2008).

In February 2006, four open houses (one in each local municipality) were conducted to discuss the draft strategy document and ask residents to complete the survey. In addition, the Strategy and the survey were uploaded on the Region's web site for those who could not attend the open houses. The public opinion about the Strategy was also investigated through a telephone survey of 600 residents that was conducted by Environics Research Group in March 2006. The results of the telephone survey are considered to be more representative of a public opinion, because of the small number of informants to the open house and web site surveys (35 and 70 respectively) (The Regional Municipality of Halton, 2006). However, the representative of an environmental organization criticizes the survey and explains that the questions were formulated in a way to produce a desired answer – support of the thermal treatment option.

According to a report by the Regional Municipality of Halton, the majority of the respondents supported the Strategy and the extension of the waste diversion programs. Similarly, most of the surveyed residents supported the initiative to investigate the implementation of an Energy-From-Waste (EFW) facility in Halton to treat the residual waste (See Figure 7) (The Regional Municipality of Halton, 2006).

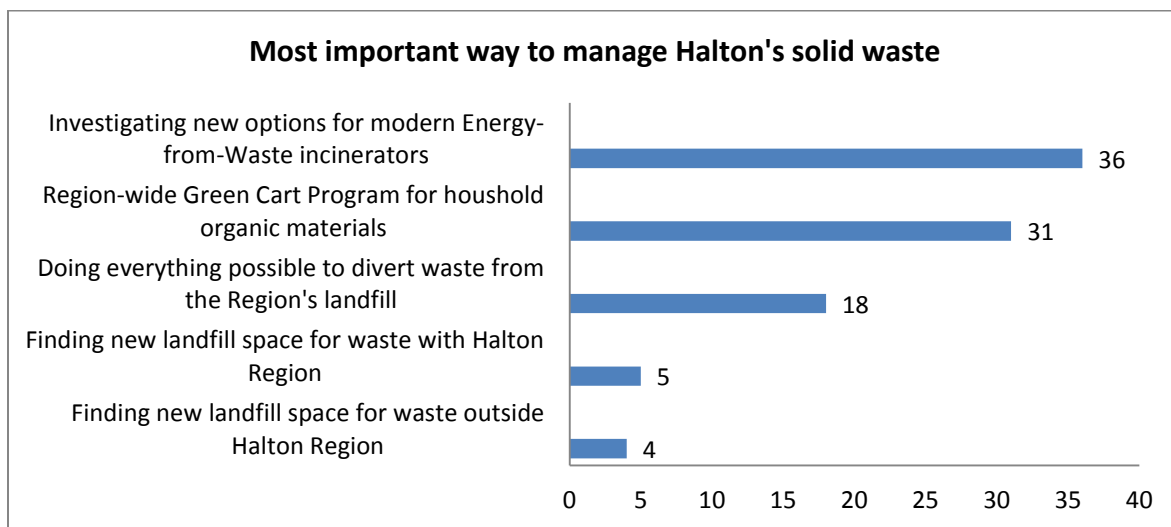


Figure 7 Results (percentage) of the telephone survey of the residents of Halton Region conducted in March, 2006.

Source: The Regional Municipality of Halton, 2006

Consequently, the investigation of EFW option was included as one of the key components of the Strategy document. Moreover, the possibility of introducing advanced thermal treatment technologies

such as pyrolysis, gasification, and plasma arc were listed under the probable future considerations (Halton Region, 2006).

Initially the construction of an EFW plant in Halton was approved by the Province back in 1989. After the Milton landfill was opened in 1992, the Province imposed an eight-year deadline on the Region of Halton to build the EFW facility, but in 2000 an indefinite extension was granted (Funston, 2006a).

In July 2006, the Council approved the report “Condition two of approval under the Environmental Assessment Act for the Halton Waste Management Site, Joint Board Decision” (Report No: CA-41-06) that directed the staff to develop a business case of an Energy-from-Waste facility. The business case aimed to investigate the best available technologies for different waste disposal scenarios and their economic and environmental implications, as well as any relevant community and social considerations. After its development, the business case was to be released for the public consultations with the final intention to make an “informed decision on how best to handle Halton’s waste over the 40 year planning period from 2011 to 2050” (The Regional Municipality of Halton, 2007a, p. 6). The Business case did not make any recommendation on which option to undertake, but rather presented the detailed information around each option for further discussions and considerations by the interested stakeholders (The Regional Municipality of Halton, 2007b).

The initiative of the Region to investigate the possibility of introducing EFW option was welcomed by the Environment Minister Laurel Broten, who praised Halton for “doing its job as a (region) seeking to manage its own waste” (Gillespie, 2006). Shortly after, a strong support to the Halton’s initiative was voiced in the editorial article of The Toronto Star calling it “a daring initiative that deserves wide support” (“Consider incineration,” 2006).

Genivar (formerly MacViro Consultants) was hired to develop a business case that consisted from a number of technical reports (The Regional Municipality of Halton, 2007a):

- Step 1A: Development of EFW Scenarios and Transportation Options
- Step 1B: EFW Technology Review
- Step 1C: Alternative EFW Systems
- Step 2: Comparative Evaluation Criteria
- Step 3: Financial Analysis
- Step 4A: Potential Health and Environmental Effects
- Step 4B: Regulatory Approvals and Planning Requirements
- Step 4C: Recommended Framework and Public Consultation

The options for the thermal treatment plant ranged from the \$250 million facility to manage waste of Halton Region until 2050, to a \$700 million plant to treat the waste from the neighbouring cities as well (Funston, 2006a).

Possibly the most important report largely influencing the future development of the project was the Step 4A peer reviewed report “Identification and description of potential health & environmental effects” (The Regional Municipality of Halton, 2007a). Discussing the common air pollutants, the report concluded the following (The Regional Municipality of Halton, 2007a, p. 13):

While the net reduction in common air pollutants demonstrated with a LCA for energy from waste facilities may have a beneficial impact on air quality across southern Ontario, the common air pollutants emitted directly at the HWMS will adversely impact air quality in Halton Region.

The Medical Officer of Health believes that, since levels of the common air pollutants in Halton Region are already associated with a substantial number of adverse health impacts, any increase in the levels of these common air pollutants in Halton’s airshed will be associated with some increase in adverse health impacts.

Step 4A report was peer reviewed by Dr. Pengally, the recipient of a City of Toronto Green award for his work on air quality, who admitted that the performance of Energy-from-Waste facilities has improved, but pointed out the lack of scientific evidence to show how much better are the current technologies (Barber, 2007a).

The interviewees interpret the results of the Step 4A report differently. Some (I06) think that the arguments of the environmental activists were largely aided by the conclusions of the medical officer who made a convincing case against the incineration. On the other hand, the supporters of the project argue (I04) that the medical officer did not state that the EFW facility would have negative impact on health and air quality, but that he was not qualified to comment on the engineering report. Lastly, the municipal official (I09) asserts that since the specific technology and the site were not yet chosen, it was not possible to provide a detailed and site specific modelling of the airshed. Therefore, many questions on possible health impacts were not answered by the presented general report that made it difficult to move to the next stage of the planning process.

The other report that is of interest for the present study is Step 4C report “Recommended framework and public consultation”. The business case recommends the following public consultation framework (The Regional Municipality of Halton, 2007a, p. 15):

- The Business Case should first be presented to Halton’s elected officials and then be made available to the broader public;

- The key information and messages related to the Business Case must be presented in a clear and consistent fashion;
- Once the Business Case has been publicly released, a series of public consultation sessions should be scheduled;
- To address question and concerns that will arise a FAQ/response document should be developed;
- There should be media relations training to ensure that the Region takes advantage of various media outlets to disseminate the desired message to the public; and
- All comments and questions from stakeholders should be documented and responses prepared.

According to the Step 4C report, the effective communication with the public involves providing information to the residents of Halton Region about “**who** is involved, **what** has been studied, **when** decisions could happen, **why** the Business Case was undertaken, and **how** future steps would be undertaken.” (p. 1-3).

4.1.2 Findings from the case study

The representative of an environmental advocacy group (I14), who was actively involved in the planning process, agrees that procedural and substantive equity influence public acceptance of thermal treatment facilities because “people don’t like unfairness”. In addition, the direct link is identified between the fair and open planning process and the fair outcome in the form of a better decision for the given project. Therefore, procedural equity is likely to lead to substantive equity.

As for the necessity of making a trade-off between achieving a high degree of substantive and procedural equity, and cost and time efficiency, this assumption is denied by the representative of an environmental advocacy organization (I14). According to Informant I14, the achievement of the fair and engaged process is not about how much money is spent, but about the early and extensive engagement of the public. Moreover, as the money comes only from one side (the Regional government), “there is an inverse relation between how much money is spent and how fair the process is” (I14). According to a representative of the environmental advocacy organization (I14), such a financial arrangement serves the interest of municipality and the Regional government who are in favour of the proposed project and who have made the decision about the thermal processing plant before the public consultations have started. On the other hand, a representative of the environmental advocacy group (I01) thinks that spending more money by the Region for having more public consultations and meetings may help to make the planning process more open and fair. As for the representative of the Region (I09), he explains that spending more money on public participation campaign and thus increasing the number of public consultations and meetings will not necessarily result in the increase of the public acceptability of the proposed project. According to him, the result may depend on the characteristics of the certain

community. In addition, different environmental groups will be heard in any case, whether there are more or less public consultations.

4.1.2.1 Elements of substantive and procedural equity

As mentioned above, the Halton case revealed the direct link between procedural equity and substantive equity. The fair outcome is associated with the decisions made based on the balanced and full information provided by all parties who are able to engage actively in the process.

The spatial distribution of facilities was not considered to be the major building block of substantive equity. Siting is not a determinant for the fair outcome, because for the environmental advocacy groups (I14) involved in the Halton case, siting was a minor issue compared to the overarching problem of having an incinerator plant as one of the waste management options. Although it is acknowledged that there will always be people who are primarily driven by NIMBY sentiments, the real fight is led by those who strongly believe that incineration is a wrong choice no matter where it is located. The representative of the Region (I09) shares the view that there is strong opposition on the level of ideas and concepts. According to Informant I09, the opposition will always exist not only towards thermal treatment plants but also towards the other types of waste processing facilities. Similarly, the other member of the environmental organization (I01) shares the view that NIMBY is still an important factor and in general, the public gets more active once the proposed project may directly affect them. However, he concludes, that as a result of the active work of the non-governmental organizations and advocacy groups, the public is becoming more and more aware of the environmental issues. The latter particularly refers to the younger population that is more active and receptive of the environmental concerns.

In case of the fundamental opposition, the accent is made on the values and priorities around the broader notions of waste management and environmental protection and not on the personal and rational interests. This explains the assertion that compensation, if offered, would not make any difference for the activists and the public involved in the process. Commenting on the possibility of compensation the leader of an environmental advocacy group (I14) responded: “our objections to incinerator were so fundamental that you couldn’t buy us off. That’s what it [compensation] is –trying to buy people off.” On the other hand, the regional official (I09) thinks that although the compensation schemes are not totally effective, they could be effective to some extent depending on the approach of people who resist the project. However, he admits that in case of the thermal treatment plants, the opposition is highly escalated and therefore a compensation scheme may not be a helpful solution.

A representative of an environmental advocacy group (I14) notes that the process was conducted according to the legal requirements and the staff adhered to the law. The groups were given possibility to

participate in the process and were notified about the public consultations and other developments. However, according to the environmental activist (I14), even with the full compliance with the legal requirements “the process is meant to defeat citizens”. Since the public meetings are organized and controlled by the very people who are in favour of incineration, they can control the process by limiting the time for the opponents to talk and ask questions, or limit the topics that can be discussed during the meeting. The other way of manipulating the process is by not giving the full information about the project. The public expects that the staff will provide a sound research and present all the views to the politicians and other stakeholders in their report.

When it comes to the provision of information and attempt to involve the public in the discussions, the member of an environmental advocacy group (I01) notes the difference between the old administration and the new one that came after the November 2006 municipal elections. According to him (I01), the new administration succeeded in providing accurate information about the thermal treatment option, whereas the old administration mainly presented one-sided information about the merits of the Energy-from-Waste alternative. In addition, the new administration provided more opportunities for the public to participate in the discussions by organizing a number of public meetings and consultation sessions.

The representative of the Region (I09) attributes a crucial importance to the provision of full information in order for the public to understand what the judgment of the project proponents is based on. Moreover, he considers the provision of the complete information as the only way to somehow mitigate the heated discussions and possible tensions among the parties.

Even though the process in Halton Region was considered to be open, the leader of the environmental advocacy group (I14) believes that the opposing party would not have succeeded solely by going through the process - attending meeting, making presentations, and submitting comments. Much work was done outside the formal process that mainly targeted the elected representatives. The following quote by an informant explains the work that the environmental advocacy groups conducted:

The only power citizens have is the power of votes we represent. We have elective representatives for a reason. We started appealing to them. We looked at each member of regional council and figured out where they were on this issue, how much we know about them, do they need more information to make decision, will they change decision. We needed to divert all our time and energy to the people in the middle – the ones who haven’t made their decisions yet. We were strategic and were advocating directly to councillors.

We did a lot of research. When we talked with elective representatives we did not make only general statements, but we were pointing at the scientific facts, municipal experiences, health studies. On top of this we held a public forum where we brought an expert on incinerators and a

financial person. We have 200 people attended and also councillors attended so that they could see that there was support of our position.

The environmental activist (I14) concludes that these efforts were fruitful as by the end of the process the majority of councillors decided against incineration, even though in the beginning many of them were in favour of the project. Some (I06) believe that the report of the medical officer played a central role in changing the politicians' views about the proposed project. In addition, the decision to draw back the plans on thermal treatment of waste was also guided by the existence of the sanitary landfill in Milton that will reach its capacity in 2023, or even in 2030 in case of the planned increase of the diversion rates. Before the acquisition of the Green Lane landfill when Toronto was facing a waste crisis, Halton was considered to have "a luxury of time" to deal with waste management issues (Gee, 2004).

The representative of an environmental advocacy group (I14) considers that the change of the political establishment as a result of the elections of the Regional Chair in 2006 played a primary role in holding back the project. Referring to the decision to draw back the plans on thermal treatment of waste in the Region, the Regional official (I09) explains that the decision was guided by few factors including the absence of the site specific study of the airshed (that was not possible to develop because the technology and site were not chosen yet), the request of the public to focus on waste diversion, the cost considerations of the project, the overall philosophy about the thermal treatment option, and the existence of the active landfill capacity.

As the final decision on the project was made by the Council, the central role of the local politicians is unanimously stressed. The representative of the Region (I09) explains that the Council makes a final decision after the staff recommends the system or the method based on its merits. The Council may agree or disagree with the recommendation, or ask for the additional information. According to the leader of the environmental advocacy group (I14), by making incineration a key issue during the Halton Regional Chair election in 2006 ("New leaders," 2006), the environmental activists were able to gain political support. On June 13, 2007, the Regional Council made a unanimous decision to cancel the plans of building EFW facility. Newly elected Halton Regional Chair Gary Carr commented: "This is a new administration, a new chair and a new council with a whole different attitude to it" (Barber, 2007b).

In spite of the active involvement of the public and environmental groups in the planning process and their severe opposition towards the project, no conflict or serious tension took place between the parties. However, the representative of the Region (I09) explains that there was an active exchange of arguments and, in some cases, an escalated discussion. The member of the environmental organizations (I14) recalls that when the project was first proposed, they met with the regional staff that was strongly supporting the incinerator. "We met them to talk about the project. We wanted to have discussion with them and

understand where they were in this issue, why they supported it”. Consequently, there was a lot of discussion, battle of arguments and facts, but it did not transform into a conflict. The conflict was mainly avoided because of the existence of trust, open discussion, and the ability to present all the arguments and viewpoints. The other important reason of avoiding a conflict was the fact that the Region had previously collaborated with the citizen and advocacy groups. Therefore, the certain level of trust was already present by the beginning of public consultations. One of the members of an environmental group (I01) notes that the existence of the constructive relationship between the Region and the community and advocacy groups is essential, however such an attitude should stem from both sides and include two way communication. The Region’s stances on this issue is echoed in Step 4A report that notes the importance of including interested NGOs in the consultation process. While preparing the Business Case, the Halton Region has developed an inventory of organizations that may have been interested in taking part in the consultation process and providing their feedback. “The collective experience of the Project Consultant Team shows that consultation with nongovernmental organizations is important in any approvals processes involving EFW or other waste management facilities” (The Regional Municipality of Halton, 2007b, p. 2-4).

The readiness of the staff to deal with the controversial situations could also help to evade the conflict. The Step 4C report on public consultation and communications recommends that “staff and elected officials involved in the project also receive a ½ day training session on how to discuss these issues with the public and the media, and how to deal with controversial situations. The scope of this training session and its desired outcomes and participants can be provided upon request by the Region” (The Regional Municipality of Halton, 2007b, p. 6-1). Furthermore, the Step 4C report seeks more active engagement of public-at-large by putting “greater effort in distributing information and receiving feedback by the larger less interested group” (The Regional Municipality of Halton, 2007b, p. 2-4).

Despite being actively involved in the planning process, environmental advocacy groups felt that the process did not involve the public from the early start, but only after the option of incineration was favoured by the Regional staff and the elected representatives. They felt that before the incineration plant could be considered, the Green Bin program should have been implemented and the number of allowed garbage bags per household per week should have been reduced. The main argument was that while pursuing an extremely expensive project of building an incineration plant, there would not be left any financial resources to strengthen waste diversion and reduction projects (I14). On the other hand, the public consultations held in Halton Region to discuss the draft Strategy on Waste Management can be considered as an effort to involve the public in the early stages of planning. As the representative of the Region explains (I09), the discussion on strategy document started before any type of Environmental

Assessment process started and it did not include only the discussion of Energy-from-Waste option, but the other alternatives as well. However, according to the Report to Chairman and Members of the Planning and Public Works Committee (Report No. PPW82-06/CS-40-06), the broader public was reluctant to participate in the open houses and online survey and give feedback about the proposed strategy document. The regional official (I09) confirms the above and explains that usually public participation is not active until a specific technology is chosen. As the strategy document presents initiatives and the concept, the public is reluctant to discuss it and provide the feedback. He (I09) recalls that the public consultations on waste strategy document were mostly attended by the small environmental groups that were actively opposing the thermal treatment alternative. On the other hand, there were groups who were in favour of this waste management alternative. However, the majority of the attendees agreed on the need to pursue waste diversion more actively through the Blue Box program and the implementation of the Green Cart program for the organics (I09).

Referring to the low attendance of the public consultation meetings, the representative of the environmental advocacy group (I01) explains that many people work, are busy and do not have time to come to the public meetings. Therefore, it is unrealistic to expect thousands of people on such meetings. In reality, the public consultations are usually regularly attended by a small group of active community members.

4.1.2.2 Contextual elements

The existence of active environmental advocacy groups in Halton Region was considered as one of the key contextual elements. In addition, the previous experience of collaboration between the community and advocacy groups and the Regional government was considered important in setting the stage for the open planning process.

Since the facility in Halton was planned to be located within the industrial area and away from the residential buildings, it was not likely to affect the property values. However, an article in The Toronto Star from September 2, 2006 reported that the possibility of building a large plant to handle about 70 per cent of the GTA waste caused fears among the residents about the possible negative impact on the environment and property values (Funston, 2006b). The member of the environmental advocacy group (I01) explains that the construction of the incinerator would negatively affect the farmers who owned the surrounding land, as they feared that their production would lose value due to the possible pollution from the incineration plant.

Perceived risk about the potential negative impact of incineration plant on the human health and the environment was recognized as one of the major factors influencing public stances. The previous experience of hosting waste disposal facilities could play a significant role as well. The latter point is closely related to the way the existing waste management facilities are managed and what is their environmental performance. However, the representative of the Region (I09) notes that the fact that the current waste management system is well managed (the waste management system is well-integrated and diverse) and waste diversion is actively pursued will not necessarily lead towards increased public acceptance of the new waste disposal options.

However, the major contextual element largely shaping the final outcome was the political involvement in the planning process. Initially, the political involvement was expressed in the strong support to the thermal treatment alternative by the Regional staff and the elected representatives. Later, the change of the political establishment coupled with the public pressure and the conclusions presented by the Health Officer diminished the political support and finally, resulted in the termination of the project. The decisive role of the political involvement was realized by the environmental advocacy groups from the very beginning. Therefore, the discussion about the possible introduction of the thermal treatment option was turned into a major election issue.

4.2 Case Study II – Niagara-Hamilton thermal treatment project

4.2.1 Background information

Niagara Region is located in southern Ontario between Lake Ontario and Lake Erie. It consists of 12 municipalities and covers the area of 1896 square km (See Figure 8). The population of the Region is 435 000 (Niagara Region, 2009). The City of Hamilton is located at the west end of Lake Ontario in close proximity both to Toronto and the US border, occupies 112,314 ha, and has the population of 504 559²¹ (City of Hamilton, 2009a; Statistics Canada, 2009b).

²¹According to the 2006 Community Profiles.



Figure 8 Map of the City of Hamilton and the Regional Municipality of Niagara

Source: RKN Regional Knowledge Network, 2010

The official cooperation between the Regional Municipality of Niagara (Niagara Region) and the City of Hamilton to study methods of solid waste disposal started on January 1, 2004 based on the Agreement for Joint Study of Waste Disposal (Agreement). The introduction of the Agreement was preceded by the adoption of planning partnership Statement of Intent and approval of the development of the Agreement by the Niagara Council and Hamilton Council in late 2003. In addition, the parties established a Joint Staff Committee and Joint Working Group of the Niagara Hamilton Waste Plan (Joint Working Group). The latter was comprised of the political and public representatives of both parties (The Agreement).

Based on the Agreement, the parties were to conduct a study - the Niagara-Hamilton WastePlan - in order to choose the preferred long-term disposal method for the post-diversion solid waste. The Niagara-Hamilton WastePlan comprised of the following milestones:

1. Selection of the preferred method of managing both parties' post-diversion waste
2. Selection of the preferred procedure for implementing that preferred method (decision on site(s))
3. Preparation of a request for proposals designed to select a technology provider to implement the preferred method, and
4. Preparation of the applications for all necessary approvals required for the preferred method under relevant environmental legislation (e.g. the Environmental Assessment Act)(The Agreement, Schedule A, Clause 7).

The decision to pursue a joint initiative was driven by the existence of the similar circumstances and common goals in the Niagara Region and the City of Hamilton, namely:

1. Approved Solid Waste Management Plans,
2. Shared waste diversion targets of 65 percent diversion from landfill,
3. Limited remaining landfill capacity,
4. A shared desire to take responsibility for and manage their own waste (MacViro Consultants et al., 2004a, p. 4).

In addition, the joint initiative was expected to reduce project planning and implementation costs for taxpayers in Niagara and Hamilton (MacViro Consultants et al., 2004a).

By the time the Agreement was adopted by both parties, Niagara Region had reached 41 percent diversion rate and had already launched organic waste collection scheme. The recycling rates were lower in the City of Hamilton and amounted to 24 percent. However, the trend showed steady increase of the diversion rates due to the improved program to collect leaf and yard waste, and expanded recycling and Green Cart²² programs (MacViro Consultants et al., 2004a).

As a first step of the Environmental Assessment process, the Terms of Reference were developed and considered by the City of Hamilton and the Niagara Region municipal councils on August, 2004. As a result, “both councils approved motions endorsing submission of this proposed EA ToR to the Minister of the Environment for approval” (MacViro Consultants et al., 2004a, p. 10).

The ToR proposed the following waste management approaches and technologies to be included in the Environmental Assessment study (MacViro Consultants et al., 2004a):

1. Thermal processing
2. Biological processing
3. Physical processing
4. Landfill
5. Additional At-Source Diversion (the 3Rs).

Among other issues, the ToR proposed public consultation plan for the Environmental Assessment process. Among the parties to be consulted, the ToR listed Public Liaison and Advisory Committees²³, First Nations groups, government and agencies, and general public. In addition, the list of the interested individuals and groups had been prepared. According to the ToR document, “it is anticipated that the scope of consultation events will move from initiatives and events addressing and seeking input from the larger community to a program that is more focused on the individuals and community with the greatest

²²Initially, the Green Cart program to collect organic waste was introduced in 2002 (MacViro Consultants et al., 2004a).

²³Niagara’s Waste Management Advisory Committee (WMAC) and Hamilton’s Waste Reduction Task Force (WRTF) (MacViro Consultants et al., 2004a, p. 28).

potential to be impacted by the proposed undertaking” (MacViro Consultants et al., 2004a, p. 29). In order to provide information to public and enable them to participate in the process, Niagara Region and City of Hamilton developed a communication strategy that implied maintenance of the study website, dissemination of public notices and news, development and issuance of public advisories. The proposed ToR regulated feedback mechanism for responding and incorporating public comments. The comments were expected to be summarized in a table together with the responses and any changes in the EA that addressed the issue. Once developed, this table would be uploaded on the WastePlan website – www.wasteplan.ca (currently terminated) (MacViro Consultants et al., 2004a).

More specific communication activities were elaborated to support the first step of the EA study – the development of the EA ToR. The tactics for the later included internal communications, external communications, and media communications (MacViro Consultants et al., 2004b). The details, including the description of the activity, its timing and estimated costs, are presented in Appendix B.

Based on the proposed communications plan, during the period of Jan –March, 2004 two public open houses and three public workshops were held in each municipality. The attendance of the workshops was higher (in average 100 individuals) compared to the open houses (in average 50 individuals). As one of the participants of the open house describes, “the only thing missing was the citizenry. ... I felt really bad about the lack of community interest” (Duncan, 2004). The attendees included the representatives of industry, municipalities, and the general public. The open house events comprised of the informal presentations of display boards, as well as the formal presentation (MacViro Consultants et al., 2004c; MacViro Consultants et al., 2004d).

The public workshops aimed to gain public input around the following issues: alternative waste management approaches and criteria to be applied to these alternatives (Workshop 1); types of sites to be considered, the criteria for identification and evaluation of the potential sites (Workshop 2); and Consultation Plan as the part of the EA ToR (Workshop 3). During the public workshops, the attendees were provided with the workbooks that listed questions about the topic of the workshop. During the first workshop, the participants were given the glossary of terms and abbreviation in addition to the workbook. The workshop comprised of the formal presentations followed by the facilitated group discussion. The display boards were also presented during the workshops (MacViro Consultants et al., 2004e; MacViro Consultants et al., 2004f; MacViro Consultants et al., 2004g).

On February 7, 2005 The EA ToR was approved by the Ministry of the Environment and consequently, Niagara and Hamilton started the approved EA study process (MacViro Consultants & Jacques Whitford Limited, 2005a).

The draft report “Evaluation of ‘Alternatives To’ and Selection of a Preferred Disposal System” was released in December, 2005 for further consultations with the public and relevant agencies. “Alternatives To” imply different waste management options. The following alternative disposal systems for post-diversion waste were investigated in the draft report (MacViro Consultants & Jacques Whitford Limited, 2005a):

1. System 1A – Mechanical Biological Treatment (MBT) and Landfilling of Stabilized Residuals
2. System 1B – MBT with Biogas Recovery and Landfilling of Stabilized Residuals
3. System 2A – Thermal Treatment of Mixed Solid Waste
4. System 2B – Thermal Treatment of MSW with Recovery of Materials from the Ash/Char
5. System 2C – Thermal Treatment of Alternative Fuels
6. System 2D – Thermal Treatment of Alternative Fuel with Biogas Recovery
7. System 3A – Landfilling of mixed Solid Waste
8. System 3B – Landfilling of Mixed Solid Waste with Recovery of Landfill Gas²⁴.

The developed alternative disposal systems were evaluated against the established criteria and environmental priorities, and were analysed using the net effect analysis. “The preferred disposal system was that which offered the preferred balance of advantages and disadvantages given the environmental priorities established by the Niagara and Hamilton communities through the public consultation process” (MacViro Consultants & Jacques Whitford Limited, 2005a, p. ES-2).

The development of the Draft Report included “four key points of consultation” with the public and agencies (MacViro Consultants & Jacques Whitford Limited, 2005a, p. ES-3). Through conducting workshops, public information sessions, and the Niagara Hamilton Joint Working Group delegation session, the public input was sought after in regard to the criteria development and priority setting, confirmation of alternative system development, confirmation of system advantages and disadvantages, and conclusions on preferred disposal systems.

In addition, public opinion was investigated through the public opinion poll conducted in September 2005. The representative sample of the study area residents were asked about their environmental priorities for selecting the long-term waste disposal system. The results of the public opinion poll and the conclusions of the workshop coincided and ranked the Natural Environment as the highest priority. Once completed the Draft Report was released for the public and agency review (the review period was from Dec 8, 2005 to Feb 6, 2006).

Based on the evaluation of the proposed waste management options, the consultants’ team concluded that the number one priority was waste reduction and at-source diversion that should form the principal

²⁴The detailed description of the options is presented in Table 1.

element in the integrated waste management system of the two municipalities. At the same time, the established 65 per cent diversion rate was considered to be “reasonably aggressive targets on which to base the planning of long-term disposal capacity.” Consequently, the preferred long-term disposal system for the post-diversion or residual waste was identified – *Thermal treatment of MSW and recovery of energy followed by recovery of materials from the ash/char* (MacViro Consultants & Jacques Whitford Limited, 2005a, p. ES-5).

During the 60-day commenting period, the draft report and its supporting documents were disseminated through the WastePlan web-site and distributed upon the request to the interested parties. In addition, three delegation sessions were organized in January, 2006 (in Stoney Creek Municipal Office, Hamilton City Hall, and Niagara Region Headquarters) and the draft report was presented to the Hamilton Waste Reduction Task Force, Niagara Waste Management Advisory Committee, Hamilton Public Works Committee and Niagara Joint Public Works and Planning Committee. Over the course of the review period, 106 comments were received. Half of the submitted comments were supportive of the proposed long-term waste disposal system, while 25 per cent were critical and the remaining 25 per cent of comments were either neutral in relation to the proposed disposal option or concerned other issues of EA process or waste management in general. “The primary source of the substantive issues identified by commenting parties ..., were non-governmental organizations, some of which were organizations based in the study area and some from organizations from outside the study area” (MacViro Consultants & Jacques Whitford Limited, 2006e, p. 3).

The comments received during the review period, as well as the responses to them and consequent conclusions about the future steps were presented in the draft report “Consideration of substantive issues identified by public on recommended long-term disposal system” (MacViro Consultants & Jacques Whitford Limited, 2006e). The report recommended that the additional work should be conducted to address the following issues: 1) “...siting assumptions for a stabilized landfill to confirm the advantages and disadvantages identified for systems that include stabilized landfill, and 2) ...studies on health risks and economic impacts”. In addition, the report proposed more detailed activities clustered in two groups of shorter term initiatives (next 1-3 months), and longer term initiatives (approx. 1 year), and a list of proposed immediate next steps (MacViro Consultants & Jacques Whitford Limited, 2006e, p. 19). The co-chairs of the Joint Working Group commented on the decision to delay the EA study process in order to gather more information about the identified issues (Niagara-Hamilton Waste Plan, 2006):

Gary Burroughs, Lord Mayor of Niagara-on-the-Lake and JWG co-chair: “We want to undertake a number of initiatives that would ensure

the Joint Working Group has all of the information required to make the right decision on a preferred waste disposal system”.

Hamilton Councillor and JWG co-chair Dave Braden: “This is a perfect example of how the environmental assessment process is supposed to work. The individuals and groups who made presentations were thorough, provided convincing arguments and they should be proud of their involvement. If delaying the project a few months allows us to make the best decision for our municipalities, then I support that.”

In accordance with the proposed recommendations, the Joint Working Group carried out additional activities including “a tour of the Otter Lake Facility in Halifax, screening of landfill opportunities, a sensitivity analysis to address the public comments, detailed response to the public comments and the Stabilized Landfill Study” (p. 2). The results of the above activities and public consultations, as well as the recommendations for further actions were presented in the staff report “Addendum to the Draft Report on the Evaluation of ‘Alternatives To’ and Selection of a Preferred Disposal System” on August 9, 2007. The report admitted that the few new developments had taken place since the release of the report “Consideration of Substantive Issues Identified by Public on Recommended Long-term Disposal System” on March 9, 2006. Most importantly, Niagara Waste Systems (Walker Industries) Environmental Assessment was approved for the expansion of the landfill in the City of Niagara Falls. Although Niagara region expressed its interest to continue collaboration on the WastePlan study, the urgency to find the new disposal capacity was dropped and the Region decided to focus on improving its diversion practices. Hamilton also intended to continue its work on the WastePlan study, “however only if this could proceed in an expeditious manner that makes efficient use of time and resources.” Consequently, the staff recommended suspending the process for a period of nine months “to allow both municipalities to focus on improvements to their diversion program (Niagara-Hamilton WastePlan, 2007, p. 6).

Following nine months after the recess in the WastePlan study, the staff report “on WastePlan next steps” was released. The report presented recommendations to the Niagara-Hamilton WastePlan’s Joint Working Group on the future steps in the joint project. The staff concluded the following (Niagara-Hamilton WastePlan, 2008, p. 6):

Niagara Region and Hamilton continue to be committed to 65 percent diversion from landfill and this will continue to be a priority for the municipalities instead of jointly pursuing alternative disposal options. The two (2) municipalities will continue to work together on matters of mutual interest, where appropriate. Waste Management Steering Committee members could meet annually or as otherwise scheduled to discuss future initiatives. However it is in the interest of both

municipalities to terminate the current agreement around alternative disposal options as they pursue their waste diversion goals.

Subsequently, the Agreement for Joint Study of Waste Disposal was terminated and in January, 2009 the WastePlan web-site was closed.

4.2.2 Findings from the case study

The answer on the questions whether procedural and substantive equity actually make a difference in defining the level of public acceptance of EFW facilities, depends on which group of the public we are referring to. According to the representative of the Niagara Region (I10), there is a segment of population that is sceptical to the proposed plan, but that is open to considering arguments and information presented during the public consultations and discussions. The other group represents those who do not believe in the scientific facts about EFW facilities and are altogether against this option. Given the anti-incineration information that is abundant, it is very difficult, if not impossible, to persuade these groups of public to change their minds about the EFW alternative. On the other hand, the third segment of population welcomes the EFW option and considers it to be the right choice (I10).

As the representative of the Hamilton-based environmental non-for-profit organization explains (I05), people can see if the planning process is open and transparent and as a result, the public will be more satisfied with the process. The open and transparent planning process should investigate all the alternatives in a meaningful and holistic way.

The assumption that higher costs for public consultation process will lead to higher procedural and substantive equity is disputed by the representative of the Niagara-based non-government organization (I02). She explains that spending more money would not make any difference, because the content of the consultation process does not change. Unless public consultations are held in an open and inclusive manner, increased number of public consultation sessions will not make any difference. In addition, only one party has available funds during the planning process, while the other party (in this case, the opposing one) is disadvantaged because of the lack of financial resources (I02). The latter point is supported by the member of the Hamilton-based environmental group (I05), who notes that because of the absence of the intervenor funding, the representatives of the community are at a large disadvantage during the planning process. Because of the one way communication, the municipalities assume that the information that they put out can be easily digested and commented by the public. However, that is not often the case and intervenor funding is needed to study these documents professionally (e.g. hire an expert) and provide meaningful feedback. The absence of the intervenor funding causes the imbalanced distribution of resources, when only one party has available funds. The request for the intervenor funding

was voiced by the general public in the comments submitted during the EA process (MacViro Consultants & Jacques Whitford Limited, 2005b, p. 27). In addition, Paul Muldoon, the Executive Director and Counsel of the Canadian Environmental Law Association provided written comments (May 21, 2004) on the draft ToR and recommended that “Niagara and Hamilton include a commitment in their TOR to make participant and intervenor funding available.” In the same letter, Mr. Muldoon explains that the participant funding “is provided prior to a hearing stage to the most engaged groups so that they can hire technical experts to help them review and comment on the proponents’ documents”, whereas the intervenor funding is “provided at the formal hearing stage to help parties to the hearing hire technical experts and lawyers.” (Niagara-Hamilton Waste Plan, 2004a, p. 15).

According to the representative of an environmental organization (I05), the provision of the intervenor funding will create an equal ground for participation and thus will result in fairer outcome that could increase the level of substantive equity. On the other hand, the regional official (I10) explains that the longer and more extensive the public consultation process is, the more opportunity the opposition has to mobilize and become more sophisticated. Therefore, spending more money on public consultation processes may have its pros and cons, although the representative of the Region (I10) notes that he is not sure whether more public consultation actually results in a better planning process.

4.2.2.1 Elements of substantive and procedural equity

The issue of substantive equity is closely related to the location of the waste facilities. According to the representative of the environmental organization in City of Hamilton (I05), once the municipality decides to host the waste incinerator, it is clear that the facility will not be situated in the suburbs, but rather will be located somewhere in the industrial core, in the area that already bears negative environmental impact from the industrial facilities. Therefore, similar facilities will most probably end up in the communities with lower social-economic status. In this case, the facility location is linked to the notion of environmental justice. In addition, vulnerable communities are often the willing host of such facilities that is directly linked to the proposed compensation schemes (e.g. financial compensation). However, the whole notion of compensation implies that the facility has undesirable impact on the environment and human health (I05).

The strong criticism about the public consultation process in case of the Niagara-Hamilton WastePlan was related to the public workshops. As the member of the group opposing the project recalls (I02), the representatives of the public organizations and general public who wanted to question the proposed alternative of introducing thermal treatment technology, felt that the meetings were rushed and did not provide an opportunity to express their viewpoints and voice their arguments. About the third of the

workshop time was dedicated to the presentations given by the consultants and by the representatives of the staff, leaving little time to discuss questions of the opposing public. “We were not allowed to ask questions because they didn’t want us to ask questions. They wouldn’t give you a chance” (I02). In addition, one of the representatives of the opposing public (I02) recalls that because of the limited time, the workshop attendees were not always able to complete distributed workbooks. According to the summaries of the workshops, approximately 58 percent of the attendees returned the completed workbooks (MacViro Consultants et al., 2004e; MacViro Consultants et al., 2004f; MacViro Consultants et al., 2004g). Even though it was possible to submit the completed workbooks later, the interviews reveal that the participants would prefer to work on the questions during the workshop. The representative of an opposing organization (I02) believes that time limitation allowed the staff to control the questions and did not leave the room for the criticism²⁵. The public comments recorded in the Summary Report of the first workshop voice the concern about the directed and controlled nature of the public consultation sessions and workshops (MacViro Consultants et al., 2004e, p. 27):

There are no workshops/public meetings currently planned that allow for public questions and answers. Without adequate opportunities to address issues, no matter how contentious, this entire process will always be viewed with suspicion.

This workshop was very controlled with no questions allowed in the open session, even to question the directions in the work book.

However, the negative appraisal of the workshops was not unanimous. The positive comments praising the facilitation of the workshop and describing it as “well planned and understandable” were also submitted (MacViro Consultants & Jacques Whitford Limited, 2005b, p. 36). The representative of the City of Hamilton (I08) notes that the comments received from the public and other stakeholders were considered. The matrix presenting the comments on what people considered as advantageous and disadvantageous were developed. Based on the examination of these matrices the preferred option would be identified.

The other obstacle for involving public in the discussion was named to be the venue of the public meetings –one of the meetings of the Joint Niagara-Hamilton Working Group was held in Stoney Creek (I02). For those who do not drive it was impossible to arrive to Stoney Creek as there was no public

²⁵The above criticism of the public participation process is documented in the written comments on draft ToR submitted on May 20, 2004 by Ms. Janes on behalf of the St.Catherines and District Council of Women (Niagara-Hamilton WastePlan, 2004, p. 2).

transport available (Niagara-Hamilton WastePlan, 2005, p. 17 and p. 94). The response to the above comment was the following (Niagara-Hamilton WastePlan, 2005, p. 27):

The Niagara Hamilton Joint Working Group has held its meetings at either the Stoney Creek municipal building or at the Grimsby municipal building since the beginning of the Niagara Hamilton Joint Study on Waste Disposal.

In response to this comment, and to accommodate wider opportunity for delegations, the Niagara Hamilton Joint Working Group has adopted a policy such that an opportunity for delegations would be provided at all Joint Working Group meetings, within the guidelines set for such delegations.

The other array of criticism relates to the provision of the “directed information” about different technologies. This discussion leads to labelling the process as bias. According to the representative of the community organization (I02), the public felt that the decision to pursue incineration practices was taken before the public consultations started. This option was already favoured by the staff and the local politicians (including the Lord Mayor), and the consequent steps were directed to implement this plan. For example, one of the first steps of the political group was to send out proposals for the possible technologies of incineration and gasification. “You could tell from the beginning that they were looking at some kind of incineration”, recalls the member of the community organization (I02) that opposed the incineration plants. She adds that the public actively participated during this period, although it was “a very frustrating experience.”

On the other hand, the representative of Hamilton municipality (I08) believes that in Hamilton people felt that the full information was provided and there was not much questioning about the completeness of the information. According to her, the information that should be explored and presented is prescribed in the ToR and as the public representatives participate in ToR preparation process, the public itself decides what information is to be provided to them.

However, the representative of the Hamilton-based environmental organization (I05) notes that the amount of the provided information is not so much an issue as the language on which the information is provided to the public. For example, when the municipality puts out an announcement about the planned facility, the word “incinerator” is never used. Instead, the facility is labelled differently and often people do not relate the project to incineration technology and therefore, do not attend the public consultations. “There is the tendency to sanitize the language” and therefore, the language use is not “simple and transparent” (I05).

On the comment to use the term “incineration” instead of “thermal treatment”, the following response was provided (Niagara-Hamilton WastePlan, 2005, p. 25):

Throughout the Niagara Hamilton WastePlan EA Study, it is intended that the more inclusive term ‘thermal treatment’ will be used, with an explanation regarding the technologies that comprise thermal treatment options. Thermal treatment options are comprised of both combustion approaches, traditionally referred to as incineration, and gasification/pyrolysis options that are not considered to be incineration as they produce a syngas product that can be used as a fuel.

The representatives of community and environmental groups recall that the situation around the planning process changed when Barry Friesen, the Solid Waste-Resource Manager for the Nova Scotia Department of Environment and Labour, became the Director of the Waste Management Services of the Niagara Region (I02, I05). They recall that Barry Friesen brought a “new spirit” as he was from the province with progressive waste management practices. Barry Friesen was considered to be instrumental in stimulating active discussions about the concept of Zero Waste in the Niagara Region (I05). His ideas and knowledge proved to be very valuable and consequently, the whole planning process became more open. This positive change was also related to the change of the Council in 2006. As the interviewee I02 described, the participants of the advisory committee were changed and those who were actively involved in closing down landfills and, therefore, advocating for the thermal treatment solution were excluded. Upon the termination of the joint project, Barry Friesen commented that one reason why Niagara stepped back was “the fear of not being able to ‘turn off the tap’ at the garbage-hungry burner” and that rather than solving the waste problem, incinerators serve as a barrier to waste diversion (Barber, 2007b).

The representative of a community group and active participant of these processes (I02) believes that if not the above mentioned changes in the leadership, the decision might have been made in favour of introducing thermal treatment option. Therefore, the outcome would have been unfair, as the process (especially, its first phase) was unfair. In this case, the interviewee I02 links the idea of substantive equity to the planning process that deals with the available alternatives, and not with the already defined decision. As she explains, in case the process starts with the open view on what are the alternatives and is not influenced by any bias, the process will lead to the fair outcome.

According to the representative of the City of Hamilton (I08), the complaints during the public consultation process are inevitable, especially when it comes to such a controversial issue. As she explains, “it would not be a good EA process without the tension” and the tension and controversy that are “healthy”. In addition, Niagara-Hamilton Waste Plan explored few waste management alternatives,

and each one enjoyed approximately the same level of support and opposition. The Energy-from-Waste option was not particularly opposed, as the preferences were spread out evenly among the different options (I08).

4.2.2.2 Contextual elements

Waste management priorities defined on the provincial level, especially the strong emphasis on waste diversion are considered to be important contextual elements. In general, the role of the political priorities and the position of the politicians were noted to be decisive. The representatives of the public related the major turning points in Niagara-Hamilton case to the change of the political leadership and consequent alteration of the priorities.

The role of the local politicians is considered to be an important contextual element, as the final outcome is made by the Council (I08). Since thermal treatment plants are municipal facilities, the ultimate decision is made by the politicians who need to accept the proposed plan or decline it (I10). Therefore, all the parties approach politicians, provide them with their information and argumentation, and try to advocate for their position. “There is nothing unusual about this, it is the part of the process”, explains the official from the City of Hamilton (I08). Once the politicians decide which way to accept, they need to explain to their constituents the rationale behind their decision. At this point, the politicians may feel that because of the strong public opposition and public concern, the unpopular decision to proceed with the thermal treatment project may hinder their re-election. Therefore, once the issue enters into the political realm and the opposition is strong enough to affect politicians, the planning process may be stopped (I05).

The previous experience of hosting incineration plant is especially acute for the City of Hamilton because of the SWARU plant. Although an opponent of incineration (I05), who was actively involved in the campaign to shut down the SWARU, admits that the current thermal treatment technologies are far superior, the public opposition towards the incineration plants will still be very strong, and primarily because of the negative past experiences. In addition, there is a wide understanding that Hamilton has a compromised airshed because of the industrial facilities in the city and the transboundary pollution coming from the Ohio Valley. There is the tendency to pressure the government to consider the cumulative effect on air quality and do not make decisions on facility by facility basis (I05).

As an environmental activist who was involved in the campaign against SWARU facility (I05) recalls, the concerns about the SWARU facility were also related to its poor management that consequently, affected the environmental performance of the plant. The negative experience with SWARU results in

the cautious approach to EFW facilities not only among the public, but also among the local politicians. Especially, the councillors from the ward where SWARU was located are particularly apprehensive about the waste incineration.

However, the long discussions around the SWARU and active collaboration between the community groups and the municipality resulted in building a certain level of trust. Although the relationships between the community groups opposing SWARU and the municipality were initially more antagonistic, today they are much more constructive. As a member of the environmental organization of the City of Hamilton (I05) explains, “I did not want to be one who is only criticizing the law. I wanted to help in developing and implementing the solution”. The existence of the previous experience of collaboration between the community and environmental groups and the municipality may prove to be beneficial in initiating meaningful discussions about different waste management alternatives, including the EFW option. However, the interviewee I05 highlights that although there is an established trust, at the end of the day the positions of the parties are shaped by the substance of the problem and not so much by the planning process. The process may help to ensure that public and politicians receive all the information and consequently, are able to make an informed decision.

4.3 Case Study III – Durham-York thermal treatment project

4.3.1 Background information

The Regional Municipality of Durham is located to the east of the City of Toronto, on the shore of Lake Ontario, and occupies an area of 2 590 square kilometres. The Regional Municipality of Durham was created in 1973 and unified the following eight Area Municipalities: The Cities of Oshawa and Pickering, the Towns of Ajax and Whitby, the Municipality of Clarington, and the Townships of Brock, Scugog and Uxbridge (See Figure 9). According to the data from May 2001, the population of the Region was 531 000, however the projected population for 2011 is 760 000 and for 2021 – 970 000 (Durham Region, 2010).

The Regional Municipality of York covers an area of 1 776 square kilometres and is located within the Greater Toronto Area. It borders Simcoe County and Peel Region from the west and the Region of Durham from the east. The Region consists of the following municipalities: Aurora, East Gwillimbury, Georgina, King, Markham, Newmarket, Richmond Hill, Vaughan, Whitchurch-Stouffville (See Figure 9). The population of the Region was 1 032 600 by 2009 (York Region, 2010).

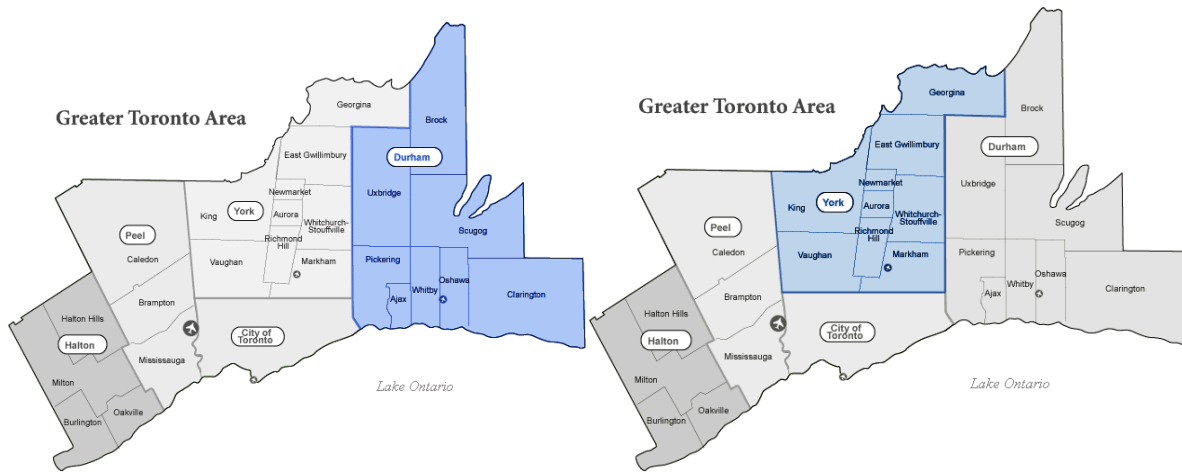


Figure 9 Maps of the York Region and Durham Region

Source: Greater Toronto Marketing Alliance, 2010.

The partnership in the waste management field between Durham and York Regions started in 2005 when a joint Residual Waste Planning Study was initiated (MacViro Consultants & Jacques Whitford Limited, 2005c). Subsequently, on June 30, 2005 the Agreement about undertaking the joint EA study was reached between two regions and the Joint Waste Management Group (JWVG) was established to manage the EA study (MacViro Consultants & Jacques Whitford Limited, 2006a). Both regions have active source separation and diversion programs for “Blue Box” recyclables and household organics. In Durham, during the years preceding the joint study, the diversion program was expanded to include more materials and establish effective organics collection and composting programs. These developments were in accordance with the “Long Term Waste Management Strategy Plan: 2000 to 2020” adopted by the Region of Durham in December 1999. The main goal of the Plan was to divert a minimum 50 percent of waste by 2007, secure an alternative disposal option, implement integrated waste management system for collecting, processing and disposal for recyclables, household organics and yard waste, residual and special waste (MacViro Consultants & Jacques Whitford Limited, 2005c).

Similarly, the Region of York expanded its diversion activities by launching a single-stream Blue Box materials recycling facility in East Gwillimbury. The facility allows to recycle about 25 different items. Moreover, in September 2004, the Region of York launched the pilot program to collect the household organics that was to be expanded to the full-scale operation by 2008. The above undertakings were in light of the strategic plan “Vision 2026” that builds upon the first strategic plan “Vision 2021” adopted by the York Regional Council in 1993. “Vision 2026” calls for the enhanced waste diversion programs, active public awareness campaign about recycling, establishment of new waste reduction and treatment

technologies (MacViro Consultants & Jacques Whitford Limited, 2005c). Following the above developments, on August 31, 2006, Michigan Senators and province of Ontario agreed to gradually reduce and finally end the shipment of MSW from GTA (including the Regions of Durham and York) to Michigan by 2010 (MacViro Consultants & Jacques Whitford Limited, 2007a).

Despite the increased diversion rates, both regions faced the shortage of long-term landfill capacity and because of the failure to site new landfills, were forced to export their waste to the landfill in Michigan. However, in 2005 the United States government initiated the legislation that could prevent Durham's and York's arrangement to export waste to Michigan (MacViro Consultants & Jacques Whitford Limited, 2005c).

Given the above circumstances, the Regions of York and Durham proposed to implement locally based solutions to manage their post-diversion waste that would be 'socially and politically acceptable' to communities and that would "maximize the protection of the environment and foster the wise management of resources which are currently lost by way of landfill in Michigan" (MacViro Consultants & Jacques Whitford Limited, 2005c, p. 4). Among the options to consider, Durham and York Regions proposed to investigate the opportunity of thermal treatment of their residual waste. Given that thermal treatment option would enable not only to treat residual waste, but also to generate electricity, both Regions found it useful to utilize waste as a fuel source to produce energy, especially in the light of insufficient energy capacity in Ontario. Thereafter, the following purpose of the undertaking was formulated (MacViro Consultants & Jacques Whitford Limited, 2005c, p. 7):

The purpose of the undertaking is to process – physically, biologically and/or thermally – the waste that remains after the application of both Region's at-source waste diversion programs in order to recover resources – both material and energy – and to minimize the amount of material requiring landfill disposal.

In proceeding with this undertaking only those approaches that will meet or exceed all regulatory requirements will be considered.

The adoption of the Environmental Assessment (EA) Terms of Reference followed the public consultation process. The public consultation methods included notices in the print and electronic media, and uploading relevant information on the study website. However, the major public consultation activities were public information sessions and workshops. The public information sessions were held in two rounds. The first round consisted of eight public information sessions and was held during October and November 2004, while the second round included six sessions and took place during October 2005. The aim of the public consultation sessions was to introduce the Study and communicate the need to find

the local solution to the problem, as well as to discuss the corresponding requirements of the Ontario's Environmental Assessment Act (Durham-York Residual Waste Study, 2006).

The workshop sessions were held during the months of February, March, April, May, June, and September 2005 in both regions and were broken down into three sets. The first set of workshops was dedicated to the discussion of "Alternatives To", the second to the "Alternative Methods", and the final to the public consultation procedures (Durham-York Residual Waste Study, 2006).

The workshop sessions dedicated to public consultation procedures and held in the Region of Durham was attended by 25 people, out of which 21 submitted the completed workbooks by the end of the session (MacViro Consultants & Jacques Whitford Limited, 2005d). The similar sessions held in York were attended by 22 participants, out of which 16 submitted the completed workbooks by the end of the session (MacViro Consultants & Jacques Whitford Limited, 2005e). Others were able to submit the workbooks later, once completed. The workbooks included detailed questions on the ways of disseminating information to public ("information out"), methods of receiving public input and feedback ("information in"), and inquiries about other possible public consultation activities that could be incorporated into the process. In addition, the questions were posed on how to motivate more public to participate actively in the process (MacViro Consultants & Jacques Whitford Limited, 2005d).

After the incorporation of the received comments, the proposed EA Terms of Reference document was supported by the Durham/York Joint Waste Management Group and in December, 2005 approved by the respective Councils in the Regions of Durham and York. Consequently, the submission of the proposed Terms of Reference to the Ministry of the Environment (MOE) was approved (MacViro Consultants & Jacques Whitford Limited, 2006a).

The proposed EA Terms of Reference identified preferred ways to manage the residual waste ("Alternatives To"): Mechanical treatment, Biological treatment, and Thermal treatment. In addition, the EA Terms of Reference document laid out the categories of sites that could be considered during the EA evaluation. These categories included (MacViro Consultants & Jacques Whitford Limited, 2006a, p. 14):

1. Publicly owned lands that meet the minimum site size and configuration requirements for the type of facility(ies) being pursued and that are located in areas that are considered to be generally suitable for the processing of residual waste; and,
2. Lands offered by a "willing seller" property owner that exhibit the minimum site size and
3. configuration requirements for the type of facility(ies) being pursued and that are located in areas that are considered to be generally suitable for the processing of residual waste.

The EA Terms of Reference document included a general consultation plan that served as a guidance for the public consultation process during the EA study. According to the consultation plan the stakeholders of this study included the following groups: Public liaison and Advisory Committees, First Nation Groups, Government and agencies, general public. In addition, the communication plan determined the scope of the consultation events that would “move from initiatives and events addressing and seeking input from the larger community to a program that is more focused on the individuals and community with the greatest potential to be impacted by the proposed undertaking” (MacViro Consultants & Jacques Whitford Limited, 2006a, p. 27).

The feedback mechanism would include the summarization of received comments, their responses and any consequent changes made in the EA study in a table format that would be uploaded on the Study website or provided as requested. The Communications Strategy for the proposed Study included the maintenance of the study website, distribution of public advisories, notices and news, and “the provision of a range of avenues for communication between the public and Study representatives” (MacViro Consultants & Jacques Whitford Limited, 2006a, p. 29).

On March 31, 2006, the Minister of the Environment approved the proposed Terms of Reference for the Durham/York Residual Waste Environmental Assessment Planning Study. According to the approved ToR, the first step of the study was the formulation and evaluation of the alternatives of managing post-diversion waste (“Alternatives To”) that included mechanical treatment, biological treatment, and thermal treatment (whereas, thermal treatment included combustion, gasification and pyrolysis) (MacViro Consultants & Jacques Whitford Limited, 2006b). Since the objective of the Study was to determine the waste management alternative that would maximize the recovery practices and minimize dependence of the landfill, the landfill only option was not included among the possible management options. However, it was admitted that the landfill would be the part of the waste management system as the disposal option for those wastes that cannot be otherwise treated or diverted (MacViro Consultants & Jacques Whitford Limited, 2006d).

The corresponding draft report – “The report on evaluation of ‘Alternatives To’ and identification of the preferred residuals processing system” – was prepared and released for the public and agency consultations. The consultations lasted during the 30-day period from April 19, 2006 to May 19, 2006 (MacViro Consultants & Jacques Whitford Limited, 2006b).

The public consultation activities included the public information sessions held to discuss the “Alternatives To” and their evaluation process (MacViro Consultants & Jacques Whitford Limited, 2006b). In total, 217 people attended the information sessions including the representatives of industry,

municipalities and the general public. Interestingly, the majority of the participants were the residents of York Region (175 individuals) (MacViro Consultants & Jacques Whitford Limited, 2006c). The attendance was much lower in the Region of Durham (42 individuals). The presented evaluation methodology and evaluation priorities were developed during the preparation of the EA ToR, however in order to confirm the public agreement with the proposed management options and their evaluation priorities, the participants of the information session were asked to complete corresponding questionnaires. The informants were asked to rank the following environmental categories to be addressed during the evaluation process: Natural, Social/Cultural, Economic, Technical and Legal/Jurisdictional Environments. Eighty three attendees completed the questionnaire (MacViro Consultants & Jacques Whitford Limited, 2006b).

In addition to the public information sessions, the Internet survey was conducted by the public polling firm Ipsos Reid to inquire about the priority ranking of the above listed five environmental categories. The responses were received from 449 Durham residents and 423 York residents. Consequently, the final priority ranking was determined that ranked the Natural Environmental Consideration as the “most important”, Socio/Cultural, Economic/Financial, and Technical as “important”, and Legal considerations as “least important” (MacViro Consultants & Jacques Whitford Limited, 2006b). Aside from the Internet survey, Ipsos Reid conducted a telephone poll with the participation of “200 individuals in Durham and 200 individuals in York to determine their support for the recommended residual processing approach” (MacViro Consultants & Jacques Whitford Limited, 2006b, p. xxii).

Based on the investigation of the relative advantages and disadvantages and the identified environmental priorities, the preferred long-term processing system for waste residuals was recommended: “System 2(a) – Thermal treatment of MSW and recovery of energy followed by recovery of materials from the ash/char” (MacViro Consultants & Jacques Whitford Limited, 2006b, p. xxi). According to the final report: “as of the end of the consultative period, there were no substantive issues that had been identified which would have resulted in adjustments to the report or supporting annexes and the majority of the public (approximately 80 percent) that participated in the consultative process agreed with the recommended residual processing system” (MacViro Consultants & Jacques Whitford Limited, 2006b, p. i-ii).

In September 2006, the consultations with agencies and public were conducted to confirm the methodology and criteria for site selection process as presented in the EA ToR (MacViro Consultants & Jacques Whitford Limited, 2007a). In total, 167 individuals participated in the Public Information Sessions the majority of which were the residents of Durham (125 individuals). In order to gain the understanding of the broader public opinion regarding the proposed site selection methodology and

evaluation criteria, the online survey was conducted by the public polling firm Ipsos Reid. The polling results revealed public preference for the Public Health and Safety and the Natural Environment categories while determining the facility site, followed by the Social/Cultural, Economic, Technical, and Legal considerations respectively (MacViro Consultants & Jacques Whitford Limited, 2007b).

The proposed methodology and criteria were refined based on the input received during the consultation process. Based on the agreed upon seven-step siting selection process, a list of short-listed sites was developed and released for the consultations with the adjacent landowners, the government review team, agencies and stakeholders, the general public, and First Nations (MacViro Consultants & Jacques Whitford Limited, 2007a).

In April 2007, four public information sessions were held (one in York Region and three in Durham Region) in order to: “provide an overview of the Study to-date; review the process used to identify potential sites; discuss the Short-List of sites, how they were identified, and obtain public input and identify the next steps in the process” (Genivar & Jacques Whitford Limited, 2007a, p. 1). The public information sessions consisted of the formal presentation and the display of the information boards, as well as the group discussion moderated by an independent public facilitator Mr. Robb Ogilvie (Ogilvie, Ogilvie & Company). In addition, the session participants were provided with the form “I didn’t get a chance to say” where they could record their comments and questions and submit them later. Compared to the other public information sessions, this set of meetings dedicated to the short-list of potential facility sites enjoyed active public participation and were attended in total by 380 individuals (Genivar & Jacques Whitford Limited, 2007a).

During the public consultation process around the short-listed sites, concerns were expressed about the possible negative impact on human health and the environment caused by the proposed EFW facility. Despite the existence of the relevant reports examining the possible impacts from the incineration facilities in Ontario, it was decided to conduct additional research to study the feasibility of siting the facility in Durham and York region. The prepared report presented solely a feasibility study and did not aim to replace the site specific health and ecological risk assessment. The objective of the report was to identify any potential issues of concern that should have been carefully studied during the site-specific risk assessment. The issues relevant to greenhouse gas emissions from the incineration plant were beyond the scope of the report and therefore were not investigated. The overall conclusion of the study was that the facility could be sited in Durham and York region, although a few health and environmental concerns related to the dioxin and furan emissions and methyl mercury were identified (Jacques Whitford, 2007).

Following the release of the Generic Human Health and Ecological Risk Assessment report, public consultations were held by organizing one drop-in centre and five public information sessions in Durham

and York Regions. Aside from advertising the event in the newspapers and radio, the notification were sent out by mail to everybody who attended previous sessions and expressed interest to be included in the list, as well as to the owners of property within 1 km of each chosen site. The total participants of the public information sessions reached 386 individuals. The format of the sessions was similar to the previous ones and included formal presentations and discussions moderated by the independent public facilitator (Genivar & Jacques Whitford Limited, 2007b).

In September 2007, from the short list of the potential sites the preferred one was identified. However, earlier two of the six potential sites were removed from further consideration because of the changes in land use designation (Clarington 02 site) and the withdrawal of the site for consideration by the property owner (Clarington 03). Based on the examination of advantages and disadvantages of the remaining four sites, Clarington 01 was chosen as the recommended preferred site for the proposed thermal treatment facility. Clarington 01 site is located south of Highway 40 in the Clarington Energy Park, covers the area of about 12.1 ha, and is owned by the Region of Durham. From the East and West, the site is surrounded by the undeveloped land currently used for agriculture. The commercial properties are located in the north of the site and in the south the Courtyce Water Pollution Control Plant is being constructed. The Clarington 01 is located in close proximity to the Darlington Nuclear Generating Station that is approximately 0.5 km away to the east (Genivar & Jacques Whitford Limited, 2007c).

To discuss the findings of the studies carried out to identify the recommended preferred site, three public information sessions were organized in October 2007. In total, 379 individuals attended the public information sessions that included a “drop-in” style sessions as well as more formal presentations followed by the discussions moderated by the independent public facilitator. During the first two sessions the Study team recorded all the comments, questions and responses that were later updated on the study website. During the third session, all questions and answers were displayed electronically. In addition, for the third session the “Facilitator’s Summary Report” was prepared and posted on the website. Those who were not able to voice their comments and ask questions, a form “I didn’t get a chance to say” was distributed for later submission (Genivar & Jacques Whitford, 2007d).

Aside from the public information sessions, interested individuals were able to submit their comments and questions via telephone or study website. In total, 166 comments and questions were received. Interestingly, the most of the questions and comments (29 comments) were received regarding the public consultation and environmental assessment process (aside from the general comments group that included 51 comments) (Genivar & Jacques Whitford, 2007e). Although the comments were considered and planned to be further addressed in the EA final documentation, the overall result of the evaluation

process did not change and therefore, Clarington 01 site remained the Consultant Team's recommended preferred site (Genivar & Jacques Whitford, 2007e).

The recommendation on preferred site was approved by the Durham and York Regional Councils in late January 2008. Consequently, during 2008-2009 the detailed site-specific studies were produced and in May 2009 a preferred technology vendor – Covanta Energy – was identified. After the completion of all the site-specific studies, the Study team prepared the formal EA documentation for submission. Public consultations on the Draft EA Study documentation and site-specific studies were held during April-June 2009. The documents issued in May 2009 focused on the initial design capacity scenario of 140 000 tonnes per year, whereas the documents released in June 2009 addressed the initial design capacity scenario as well as the maximum design capacity scenario of 400 000 tonnes per year. Aside from the consultations with the agencies and general public, the separate consultation sessions were held for the representatives of the First Nations. The general public was invited to participate in the two public information centres held during May 2009 in Bowmanville. The format of the public information centre included the afternoon drop-in style session and evening session with formal presentation and the Q&A session moderated by an independent facilitator. The total number of attendees of the public information centres was 281. Out of those who registered their names and addresses, about half of the attendees resided within the 5km radius from the proposed site, the rest were from the other parts of the Durham Region (Jacques Whitford, 2009e).

On July 31, 2009 the final Environmental Assessment Study documentation was submitted to the Ministry of the Environment. Among other reports, the study documentation included the full record of public consultations. During seven weeks after the submission, public and government agencies could submit their comments to the Ministry. In order to address the received comments, the EA study was amended and resubmitted to the Ministry of the Environment in November 2009 (The Regional Municipalities of Durham and York, 2009). In December 2009, the addendum to the amended EA Study was submitted to the Ministry with the intention to clarify information about the Request for Proposal evaluation process that identified the thermal treatment vendor (Durham/York Residual Waste Study, 2009).

In February 2010, The Ontario Ministry of the Environment released the Notice of Completion of the Review of the Durham/York Residual Waste Study Environmental Assessment. During the preparation of the Review document, the ministry examined the Environmental Assessment documentation as well as the comments received from the public, government agencies and Aboriginal communities (The Regional Municipality of Durham, 2010). The Review concludes that (MOE, 2010a, p. 1):

...the EA has been prepared in accordance with the approved Terms of Reference and the Environmental Assessment Act. The proposed thermal treatment facility will benefit the communities in the Regional Municipalities of Durham and York. The Ministry is satisfied that the proposed mitigation methods and contingencies will ensure that any potential negative impacts will be minimized and managed.

The release of the review document was followed by the five-week comment period (The Regional Municipality of Durham, 2010). On November 19, 2010 the Ministry approved the Amended Environmental Assessment by issuing the Notice of Approval to proceed with the undertaking (MOE, 2010b). On June 28, 2011 the Ministry of the Environment of Ontario issues the Certificate of Approval for the Durham-York thermal treatment facility (MOE, 2011c)

The share of the York Region in the project will be less compared to its initial intent. In 2007, York Region drastically reduced its financial commitment saying that it will have much less waste to incinerate than was initially estimated. Consequently, instead of covering 50 percent of the costs, York Region will only cover 12 percent. As a result, Durham Region will have to pay \$50 million more (Vyhnak, 2007a).

4.3.2 Findings from the case study

The interviewees agree that the procedural equity influences public stances towards thermal processing plants. One of the consultants (I03) notes that if the planning process is not open, the public will question the decision. Consequently, it is important to ensure a transparent process and present all the available alternatives in order to gain a broader understanding and support. At the same time, he admits that even if the process is fairly open and transparent, the opponents will still question it, because “it is the easiest to question the Environmental Assessment (EA) process, rather than the research with definite conclusions. In EA process everything is grey, there is no black and white, it is all qualitative and subjective.”

Regarding the necessity to make trade-offs between achieving high degree of substantive and procedural equity, and cost and time efficiency, one of the officials of the Regional Municipality of Durham (I07), thinks that increasing the number of public meetings and public consultations will not increase the level of public acceptance. According to her, the public can be divided into three distinctive groups: the first group consists of about 25 percent of people who support the project for different reasons, the second group that unifies the other 25 percent will strongly oppose the project despite the efforts to respond to their criticism, and the remaining 50 percent of the public is usually the group that has not made the decision. Therefore, the major efforts are directed towards the third group. However, at the same time, the essential efforts in terms of the meetings, consultations and information campaigns are

usually enough for the undecided public to make the decision and therefore, the additional meetings and sessions will not make difference (I07).

The interviewees representing consultancy firm (I03) and energy-from-waste industry (I04) share the similar view that the public is not homogeneous in its attitude towards the proposed project – some are open to consider new alternatives and make decisions based on the provided information, but others are strongly opposed. One of the consultants (I03) also notes that after a certain point, the new input was very little during the public consultation sessions and the questions that had already been answered were asked over and over. Therefore, it is important to weigh how much value the additional consultation may have for the process. As the representative of the Regional Municipality of Durham (I07) explains, eventually, the decision should be made by the Regional Council on how much it is worth politically to conduct more meetings. The number of consultation sessions may depend on the area that the project covers (I03). The meetings should be held in a close proximity to the places where people live, thus making it convenient for them to attend the consultation sessions. Therefore, if the area of the project coverage is large, more consultation meetings will be required.

The representative of the environmental group agrees that the increase of costs on public consultation campaign does not lead to the increase level of public acceptance, however, the explanation is different. A representative of the environmental organization (I14) believes that spending more money will not lead to more open and transparent process. On the contrary, “there is an inverse relationship between how much money is spend and how fair the processes is”, as the money comes only from one side and therefore, the opposing side is in a disadvantaged position (I14). The central issue is not how much money is spent, but how open and transparent the planning process is. Similarly, a comment made during the workshop in Durham on EA ToR, highlights the importance of the content of public meetings over their frequency: “Quality of public participation is more important than quantity” (MacViro Consultants & Jacques Whitford Limited, 2005d, p. 15).

Even though the costs needed for public consultation activities could be estimated according to the approved Terms of Reference, some (I12) think that at the end of the day, much more is done (if the money is available). Once the issue is raised, it needs to be addressed and therefore, the whole process is reactionary to certain issue that leads to more extensive public consultation process (I12).

One of the participants of the anti-incineration campaign (I13) thinks that spending too much money may result in a certain trap when changing decision or terminating the project may no longer be possible. As he explains, the voters may be unsatisfied to see that a lot of money is spent on the process that does not lead anywhere and does not provide any solution.

4.3.2.1 Elements of substantive and procedural equity

The answers on the question about the substantive equity revealed different aspects of the issue. According to an official from the Regional Municipality of Durham (I07), the solution offered to the Region of Durham is the best and therefore, it is a fair solution. The best solution implies that it offers benefits of various types (e.g. economic, environmental, etc.) for a long-term as well as a short-term perspective. One of the consultants (I03) stresses the importance of providing accurate and full information as well as using data and models that are accurate and applicable to the given circumstances. In case all the groups come to the decision that the proposed project is the best solution to the problem, than the construction and operation of the facility would be a fair outcome of the process. However, the protection of the environment does not stop when the EA process is over (I03).

The idea of compensation was unanimously negatively evaluated by the interviewees, despite their conflicting views on the project (I07, I14, I13). The representative of the Durham Municipality (I07) believes that once you offer compensation, you imply that something is wrong with the facility. Since no significant impact was detected in relation to the proposed EWF facility, the compensation is not offered (I07, I03).

Most of the interviewees who represented the proponents of the project, stressed the unprecedented scale of the public consultation process of the Durham-York project. A representative of the Regional Municipality of Durham (I07) explains that even though the minimum requirements to notify and inform the public are defined by the Environmental Assessment process, from the very beginning it was evident that much more efforts would be required to take. Since the similar project has not been implemented in the Province for more than 25 years, it was needed not only to inform the public, but also to educate them about different aspects of the thermal processing technologies, as well as to educate staff members and the elected officials. In addition, the Region lacked the guidance from the Province during the EA process. Due to the fact that the similar facility has not been planned and constructed for more than 20 years, there was the lack of the expertise in the field. However, the close collaboration with the Ministry of the Environment of Ontario proved to be successful in terms of defining and streamlining the process and acquiring valuable knowledge by all parties (I07).

The lack of the provincial and federal guidance was also mentioned by an attendant of the facilitated workshop on April 14, 2007 (Ogilvie, Ogilvie & Company 2007b, p. 39-40):

I'm from Toronto and thank you Durham and York for saying "no Toronto waste going to your incinerator". As individuals, our job is to divert as much waste from disposal as we possibly can. I am very passionate about that. I put garbage out 3 times a year and I divert 97% away from all disposals. That is our job. That's the community's job

and everybody here in the GTA probably has a system for recycling and composting that you could all participate in and do the same as my family does. The second thing is that the Province is not stepping up to the plate. They are not telling us what is the best thing for breathable air, drinkable water and safe food. They don't have anything in Ontario that they are promoting as really being environmentally friendly, that is going to protect public health and public safety. The third thing is that the Federal Government also is never stepping up to the plate. They did once in the 1990's and they did look after reducing packaging in industry, behind the scenes, by 50% but our garbage everyday is packaging and products. We need them to step up to the plate to put into legislation to stop all of this unnecessary packaging or turn it into things that we can divert to recycling or composting. Industry needs the Federal and the Provincial Governments to step up to the plate to put a policy framework in place that means that they are producing things that are recyclable and that are in fact compostable as well. We need a new kind of society. We are going into a new kind of era. If climate change is anything that they are predicting, everybody should be really very participatory in doing all they can to stop carbon from going into the air. Smoke stacks are monuments to climate change. We need to do things differently. Thank you.

One of the active members of the public (I13) looks at the above issue differently and explains that “the municipalities should be at the forefront of fighting for sustainable solutions instead of looking at such solutions as incineration.” The initiatives should come from the lower level of governance and, thus, the municipalities should be more actively involved in directing provincial and federal legislation.

Numerous consultation meetings were held in both municipalities. The cost for the educational campaign was about half a million dollars and included seminars at schools, presentations in various organizations (e.g. Chamber of Commerce, gardening clubs), writing newspaper and magazine articles, conducting public information sessions and facilitated workshops, preparing TV and radio announcements, distributing information bulletins (I07, I03). A representative of the energy-from-waste industry (I04) notes that after such an extensive public consultation campaign it would be impossible to say that the public has not been informed about the proposed project. According to him, once the number of public consultations is deemed enough, they should be ceased as spending hundreds of thousands of dollars on numerous public sessions seems to be a waste of money.

According to a representative of the consultancy (I03) and an official from the Regional Municipality of Durham (I07), education campaign started from the very beginning of the project and continued during every stage of the planning process. They recall that after the identification of the need to introduce new capacity of waste treatment and disposal in the Region, the consultations were held in every municipality

with the public. The proposal to construct a new landfill was immediately rejected and therefore, the alternative options were thermal processing, mechanical biological treatment, and stabilized landfill. The “Report on Formulation of Alternative Residuals Processing Systems” explains the reasons for rejecting the alternative of constructing a new landfill for the Region. The public opposition and desire to minimize the landfill use was named as one of the reasons (MacViro Consultants & Jacques Whitford Limited, 2006d, p. 2-23):

The results of consultation in both Durham and York during the preparation of the EA Terms of Reference (see EA Terms of Reference Consultation Record, Summary of Consultation on “Alternatives To”) and consultation undertaken in regards to the formulation of alternative systems (see Annex B of the Report on Evaluation of Alternatives to and Identification of a Preferred Residuals Processing System) indicate public support for minimizing the role of landfill in future residuals processing systems, and the need or preference to recover resources that remain in the residual waste stream.

The information was distributed about various energy-from-waste technologies and the general feedback was positive about introducing thermal processing capacity. The feedback was received through conducting a survey as well, that gave the possibility to understand the broader reaction on the proposed project in the Regions (I03). One of the consultants (I03) thinks that conducting survey is especially important as not everybody is able to attend the consultation session, especially those not living in the direct proximity to the proposed site, however the final decision will need to service the whole Region. A representative of the environmental organization (I04) shares the above idea that conducting a survey or a referendum could be helpful in understanding public stances, however, beforehand the public should be educated about different alternatives.

According to an official of the Regional Municipality of Durham (I07), 140 000 pamphlets with questionnaires were sent out with the aim to raise the awareness about the proposed project. 10 000 completed pamphlets were send back by the public, the majority of which positively responded to the proposed option to treat post-diversion waste. At the same time, there was a strong emphasis from the public to enhance the current diversion activities and therefore, the Council decided to increase the funding for diversion programs. During this period, a new composting facility was opened and the diversion practices such as the Blue Box and Green Bin programs were expanded.

Most of the interviewees note that the public attendance during the earlier stages of the planning process was not high and add that this is a normal practice of the EA process (I12, I07, I03). However,

once the discussion shifted towards the preferred location, the public attendance drastically intensified (I07, I03, I06, I12). While commenting about the above, a representative of one of the consultancy firms (I03) admitted that there is the value in trying to involve public early in the planning process as this may result in better understanding of the project and the planning process and may make the final outcome more acceptable. A member of the environmental organization actively engaged in the process (I13) also stresses the importance of starting early conversations with the public. At the same time, he notes that whereas the public attendance was not high during the earlier phase of the planning, after the environmental and advocacy groups started an activism about the proposed project, the public became actively involved in the process. People are busy with their everyday lives and often lack the knowledge and information about what is going on in their communities. Therefore, educating them about the overall problem of waste management and more specifically, about the developments in the Region was central for motivating them to participate actively (I13).

A representative of the Regional Municipality of Durham (I07) believes that the Durham-York project has “unprecedented support from the public”. According to her, there are only few people who strongly oppose this option. The general public is at large, in favour of introducing thermal treatment practice (I04, I07). Other interviewee (I12), who provided consultancy services during the planning process, shares the view that the opposition to the Durham-York project consisted of a very small number of people who were mostly very local and that the general public expressed its support to the project through the polling. However, he adds that “for many cases, very small number of local people plays a big role in planning process.” A representative of the consultancy firm (I03) explains that the opponents to the project are well-prepared and well-organized groups of six-seven people who attend the public consultations regularly and actively oppose and criticize the project. The opponents of the project have a fundamental belief on how the waste should be managed and they strongly support the idea of the Zero Waste (I04). However, a member of one of the environmental organizations (I14) does not agree that the opposition to Durham-York project was well organized. According to her, it was a “loose collection” of individuals, who decided to follow the process by attending all the meetings, submitting comments, and making presentations. They failed to engage the broader public from the very beginning and use the power that voters have to influence the decision-making process. Bringing the issue up to the political agenda and having the project become an election issue is considered to be the most effective strategy both by the representatives of the public organizations opposing the incineration plant and the representatives of the consultancy firms. As the latter (I12) explain, “it all goes back to the political forum, if the opposition has the political votes in terms of getting people not elected again, then officials will change their mind”. On the other hand, one of the representatives of the environmental organization

(I13) considers that the activism of the community and environmental groups influenced the decisions that some politicians made, who eventually voted against the incineration.

According to an official from the Regional Municipality of Durham (I07), the main reason for the public support is the transparency of the planning process and the commitment to demonstrate that waste reduction and recycling are priorities. A representative of the environmental organization (I13) who strongly opposed the incineration project considers that the planning process was transparent and adhered to the Environmental Assessment requirements; however, the process could not change much, as the decision was already made. As he explains (I13):

During these public consultations they were listening, taking down information, doing their due diligence on what they needed to do according to the Environmental Assessment. I don't think that they did anything wrong in this respect, but I don't think that it could've changed the decision that was already made.

Therefore, despite the desire to provide their input, the community members and advocacy groups were not able to do so, as they felt that the decision was already made to build a thermal treatment facility (I13). Similarly, environmental activist Linda Gasser labels the outcome to be determined and explains that “the process hasn't allowed any real options to be considered.” According to Ms. Gasser, “power and money” are behind the actions of politicians who support the incineration project (Vyhnak, 2007b). Further criticism is voiced by residents towards the Durham Region's politicians who are blamed not to pay due attention to the public's concerns. “These people aren't listening to us. It's insulting and it's degrading”, explains environmental activist Jim Richards (Vyhnak, 2007b). Ms. Gasser critiqued councillors for creating a “credibility gap” during the planning process. According to her, “Clarington council as a whole has not consistently supported a fair and transparent local consultation process” (Vyhnak, 2007c).

At the same time, a representative of the Durham Municipality (I07) admits that some will question the transparency of the project and will claim that provided information was not accurate and truthful. In response to this, she notes that the planning process is “under the microscope of so many agencies” and this particular project resulted in a very comprehensive, even unprecedented planning process. Contrary to the claims on provision of the full and accurate information, a representative of the environmental organization (I14) claims that the information on total construction and operation costs were not provided to the public. The reason was that the size of the proposed facility was not yet determined and therefore, the total construction and operation costs were also not known. “So, they asked the Council to make decision without knowing that the final option would be, how big it would be,

how much it would cost”. Moreover, according to her, the inconsistency in providing information about the size of the incinerator undermined the public trust:

When the public looked at the documents, they realized that the small incinerator wouldn’t be viable. They asked the region if they really were going to build the small incinerator, because economically it wouldn’t make sense and the region kept saying “yes”. And then all of the sudden they said “no”. So, the region says one thing and they end up doing something else. The public is told one thing, they make up their mind about it and then suddenly there is a switch. Public can’t trust it. It happens because they tell public what they want to hear to pass the decision and then they do what they intended to do from the beginning. It is a deliberate misrepresentation in most cases²⁶.

Similar to the above criticism, a resident of Whitby in the comment submitted on May 12, 2009 complained about the lack of full and balanced information about the preferred technology vendor – Covanta. The comment reads: “...The region should be providing full information – positive and negative – to the residents. They are manipulating and lying to us!!” (Jacques Whitford, 2009d, p. 9) The request to present full information about the air emissions was raised during one of the facilitated workshop. The excerpt from the workshop summary below illustrates the question and answer exchange between a resident from Courtice and David Marriman, former consultant with GENIVAR (the discussion is facilitated by Robb Ogilvie, the Independent Public Facilitator) (See Box 1).

As a representative of the Regional Municipality of Durham (I07) explains the opposition towards Durham-York project mostly consisted of the individuals, rather than Non-Governmental Organizations (NGOs) and community groups. She admits that the confrontation between parties was tense, because many would get very emotional about the issue. Some expressed the concern that they did not know whom to trust. However, an official at the Durham Municipality (I07) believes that they succeeded in convincing public that they cared.

Conflict and confrontation during similar planning processes is seen to be unavoidable. The provision of full and accurate information is deemed to be central in conflict management, while the possession of inconsistent and often contradictory information by different parties is considered as one of the reasons behind conflicts. Often opposing parties use different data sources and list of references that result in the conflicting conclusions (I07, I03). A representative of the consultancy firm (I03) explains that most of the literature is based on the old plants that often had bad environmental performance, while the data about current technologies is relatively scarce due to the limited number of EFW facilities in North America. A

²⁶See Appendix C for the excerpt of the Question and Answer session from the summary report of the facilitated workshop held on April 14, 2007 that illustrates this discussion over the capacity of the planned incinerator.

representative of the energy-from-waste industry (I04) thinks that the media plays a central role in informing and educating public about the thermal treatment option. According to him, the media mostly talks about old school incinerators and does not pay as much attention to the new incinerators, because the controversial issues are usually more popular and contribute to higher newspaper sales.

Box 1. An excerpt from the facilitated workshop held on April 12, 2007

“Q: ...When as Roger Anderson said and, when I read the article in the local paper, he said “the emissions will be as little as possible”. Well hell, that means anything. That means there could tonnes of smoke coming out. Any day of the week! Little as possible, is nonsense. What I need is hard facts, figures. In fact no emission is what we should really be looking at. No emissions. That’s the question.

R: Okay. David?

D: Yes. There are some emissions. And, as Chair Anderson said, they’re very small. And I’d be happy afterwards to share the nitty gritty numbers with you. To go to perhaps a broader perspective, these facilities have been put up by countries, most of northern Europe has mandated by law that anything left after recycling goes into one of these facilities. And there’s been health studies done. The Region of Peel, had 2/3’s of it’s waste go to an incinerator, and we have the data, of what the emissions are. And what the effects of those are. And they’re very small in relation to many other industrial sources. But they are there. And to carry this further, on another aspect of the study that’s currently ongoing, is to take those emissions and then consider the health impacts. And the effects that those emissions have on both the health of the environment, and on the health of people. And the result of that health study will be the subject of a future consultation event.

R: Okay. Follow up question?

Q: No, I understand all that. But I still don’t see, you know I haven’t heard how much the emissions are. And I haven’t heard, where they’re going to go.

R: Okay. David?

D: Well, we have numbers like 10 to the minus 9 grams per, per cubic meter. And we have lots of numbers, which I’d be happy to share with you, in terms of what they are. It gets pretty nitty gritty. But we have that data, and I’d be happy to share that with you.

R: Sorry. Can, can I jump in for a minute, even though I’m intruding on your time. The gentlemen said, “tell me what emissions are going to be”. Now part of that I assume you want to know what substances?

Q: And where do they go?

R: Okay. Can you give him an idea of the substances, and some indication of how little, or how much ?

D: Yes, the vast majority of what comes up, is carbon dioxide, and water vapour. When you see the white plume coming up, that’s water vapour. It’s the same as when you exhale on a cold winters day. And that’s the vast majority of what’s there. In addition to that, there are trace contaminants being placed into the air. Those include small amounts of sulphur dioxide, nitrogen dioxide, as well as a number of very small amounts of heavy metals. And they’re discharged into the air. The quantity that they put out is much less, than many of the other industrial type facilities around.

R: Okay. And your studies are going to look at this?

D: We have modelling that I can share with you. We’ve done some preliminary estimates of the quantities that are discharged into the air. And then what we’re currently doing is taking those quantities, and considering the health effects, and health impacts of those emissions, on the population and on the natural environment. To assure people that this is going to be safe.

R: And you’re going to be bringing the results of those studies back to these people?

D: Yes, to a future meeting.

R: And giving you all the detail you need on it, I think.

Q: Thank you.

Source: Ogilvie, Ogilvie & Company. (2007a). Durham/York Residual Waste Study.Summary.Public Information Session. Clarington Beech Centre, Bowmanville. April 12, 2007. p. 19-20.Retrieved from: <http://www.durhamyorkwaste.ca/pdfs/study/appendices/Facilitator-Summary-Report-Ididnt-Get-a-Chance-to-Say-April-12-07.pdf>.

The issue of the non-balanced coverage of the planning process in the media is raised by the opponents of the thermal treatment option as well, however their concern is that the criticism and the opposition to the proposed project are not duly represented in the local media. While discussing this topic, a member of the environmental group (I14) noted that in case of the Durham-York project “the citizens cannot get through their point in the newspapers. They are refused or not quoted.” In addition, in the email sent to the Durham-York Waste Study staff, a representative of the public complains about the biased coverage by the “Clarington This Week” about the proposed incinerator and the reporting on the June 16, 2009 Council meeting. The email reads: “...I find your coverage and reporting greatly biased. It is not that that you did not try to cover the pros and cons. Yes you did but the coverage is greatly lopsided in favour of Covanta...” (Jacques Whitford, 2009a, p. 330).

Such a dichotomy of information that usually suggests contradictory conclusions appears to be confusing for those who have not yet made a decision about the proposed project. One of the participants of the facilitated workshop held on April 21, 2007 raised this issue (Ogilvie, Ogilvie & Company, 2007c, p. 36):

We’re getting, a lot of contradictory information here. There’s the... EU information saying that they’re backing off this technology. There was the Roger’s Cable program, the article in the Star, you know, also the health information that’s been presented and what you’re saying is there’s no real health impacts, because it’s been used all over Europe and you know everything seems fine. And then we have other studies that say it’s not fine. How do we know who to believe?

The issue of trust in relation to the contradictory information about the environmental performance of thermal treatment plants was raised in the submitted question presented below (Durham York Residual Waste Study, 2007b, p. 9):

Question 13c: Why should I trust that you will do that?

Answer provided by Dr. Chris Ollson: I have a team of health professionals and there are peer reviews. Please do not trust one study. You need to trust that there are a lot of people doing peer reviews. I encourage you to look at those peer reviews to confirm that what we are saying is valid.

The further confusion about the proposed plant could have been strengthened by the petition (“75 Durham Doctors”) submitted to the Clarington and Durham Councils as well as to the Region by the physicians who expressed their concern about the possible negative impact of the proposed plant on

human health and the environment and urged the Region to explore other options to treat the residual waste that would exclude incineration (Jacques Whitford, 2009a, p. 95-203).

The response to the questions raised by the public about the petition of the concerned doctors was the following (Jacques Whitford, 2009c, p. 2-3):

Concerns expressed by Durham doctors were received and reviewed. The Medical Officer of Health (Dr. Kyle) engaged peer reviewers to review the SSHHERA [Site Specific Human Health and Ecological Risk Assessment] and to inform his decision. Based on the outcome of this peer review, Dr. Kyle made a report to Committee and Council that:

- The final SSHHERA be accepted and submitted to the MOE;
- Following EA approval and construction, during operation an environmental surveillance program be implemented with the following principles:
 - o Continuous and periodic stack testing of chemical emissions including dioxins and furans, that meets or exceeds the more stringent of the Ontario guidelines A-7 and EU directive
 - o Stack testing be supplemented by independent ambient air and soil testing for a minimum of three years at which time its effectiveness will be evaluated;
 - o That independent testing of flora and fauna be considered if in-stack, ambient air and soil test results regularly exceed levels predicted by the SSHHERA,
 - o Stack testing not be supplemented by human biomonitoring,
 - o That environmental surveillance results are communicated to the public in as an accessible, accurate, open, timely, transparent and understandable manner as possible,
 - o That an advisory committee be formed;
 - o That the Health Department is consulted by the MOE before it finalizes its requirements for the surveillance program;
 - o That the Region continue to pursue the goal of 70% waste diversion;
 - o That the Region adequately supports the environmental surveillance program, independent environmental testing, public reporting of data, and work of proposed advisory committee.

See Report 2009-COW-01 – June 16, 2009 for full text.

A representative of the Durham Municipality (I07) believes that the way to mitigate the conflict and try to find common language is to be knowledgeable about the subject, be open to all the questions and answer them truthfully, even admitting that you do not have an answer, if this is a case.

4.3.2.2 Contextual element

Previous experience of hosting thermal treatment plants was considered to be an important contextual element, as well as the management practices of already existing facilities. One of the interviewees (I07) explained that the worst is when the facility is constructed but there is a lack of long-term commitment to maintain and upgrade it.

The characteristics of the community were also considered to be an important factor. Namely the level of education and awareness of the community could largely influence the responses towards the proposed project. A representative of the Regional Municipality of Durham (I07) explains that usually people who have travelled to Europe and are aware of thermal treatment practices that take place there, are more open to this option. Therefore, the presentations made in the communities may differ, based on the “community sophistication and education.”

The involvement of the local politicians was considered to be a central contextual element, as the politicians make the final decision over the municipal projects (I03, I12). Some (I03) believe that, it has been difficult to make a decision for the politicians because of the mixed reactions from their constituents. Therefore, many local politicians have done research and deeply inquired about the issue in order to understand its benefits and limitations.

One of the interviewees (I10) noted that the issue gets even more politically contentious because some of the politicians who are in the Regional Council and are the proponents of the project, also sit in the local council of the Clarington, where the facility is planned to be built.

A representative of the environmental organization (I14) notes the difference in the institutional arrangement of the Region of Durham and the other regions. The Region of Durham has a non-elective chair and therefore, is not constraint by the public opinion as much as those Chairs who are directly elected (e.g. Halton Region). A representative of the energy-from-waste industry (I04) shares the similar view and thinks that, in some respects, the Chair of the Region of Durham is able to be little more determined when it comes to EFW project proposal. Most of the interviewees agree that for the success of the similar processes, it is necessary to have a champion who will lead the project on the political level (I04, I10, I12).

Although the issue of property values was not considered important by the interviewees, who mainly attributed this factor to the planning process of landfill sites, the concern over the possible impact of the

proposed facility on the property values was raised a few times during the public consultation sessions and in the submitted comments and questions (Durham York Residual Waste Study, 2007a, p. 8 and p. 15; Durham York Residual Waste Study, 2007b, p. 15; Genivar, 2007, p. 49; Jacques Whitford, 2009b, p. 11).

The brief summary of some of the characteristics of the above discussed three case studies is presented in Table 5.

Table 5 Some of the characteristics of the discussed three case studies

	Case Study I – Halton Region	Case Study II – Niagara-Hamilton	Case Study III – Durham-York
1. Proponent	The Regional Municipality of Halton	The Regional Municipality of Niagara and the City of Hamilton	The Regional Municipality of Durham and the Regional Municipality of York
2. Regulatory authority for EA	-	Ministry of the Environment of Ontario	Ministry of the Environment of Ontario
3. Consultants hired	Genivar (former MacViro Consultants)	MacViro Consultants and Jacques Whitford Limited	MacViro Consultants and Jacques Whitford Limited
4. Period covered in case study	2006-2007	2004-2009	2005-2011
5. Capacity of thermal treatment project in MSW tonnes/year	The following alternatives were considered: a) for mass-burn incineration - 100 000, 250 000, 500 000, 800 000, 1200 000, b) for advanced thermal treatment technologies - 100 000, 250 000 ²⁷ .	About 145 000 tonnes/year ²⁸ .	140 000 tonnes/year ²⁹
6. Class or individual EA	Only business case of an Energy-from-Waste facility was developed	Individual EA	Individual EA
7. Diversion goals in the Region	60% diversion rate (according to 2006-2010 Solid Waste Management Strategy) ³⁰	65% for both the Regional Municipality of Niagara and the City of Hamilton ³¹	60% for the Regional Municipality of Durham ³² . 70% for the Regional Municipality of York

²⁷Halton Region, 2007.

²⁸Genivar and Jacques Whitford, 2007f.

²⁹The Regional Municipality of Durham, 2008.

³⁰Halton Region, 2006.

³¹Niagara-Hamilton Waste Plan, 2008

³²MacViro Consultants& Jacques Whitford Limited, 2005c.

	Case Study I – Halton Region	Case Study II – Niagara-Hamilton	Case Study III – Durham-York
			by 2016 ³³
8. Existence of past/present thermal treatment facilities	None	The SWARU incineration in the City of Hamilton (1972- 2002)	None
9. Does EA follow from waste management plan/strategy?	2006-2010 Solid Waste Management Strategy	Joint Study of Waste Disposal (Agreement) between the Regional Municipality of Niagara and the City of Hamilton	Joint Residual Waste Planning Study initiated by Durham and York Regions.
10. Current/projected access to landfill capacity	The goal is to extend the life of the current landfill for about seven years (from 2023 to 2030) ³⁴	For the Regional Municipality of Niagara: Humberstone landfill has capacity until 2016, Niagara Rd 12 landfill has 45 years of capacity, first tonnes shipped to Walker landfill in 2011 ³⁵ . For the City of Hamilton, the Glanbrook landfill capacity is approximately 26 years ³⁶ .	1.2 million m ³ of approved capacity remains as of 2007 for the Brock Township Landfill for the Regional Municipality of Durham ³⁷ . In the Regional Municipality of York the Keele Valley landfill closed in 2002, all the post-diversion waste is shipped outside the Region ³⁸ .
11. Alternatives considered	Landfill and thermal treatment option ³⁹	Mechanical Biological, Treatment/Landfill, Thermal Treatment, Mixed Solid Waste Landfill ⁴⁰	Mechanical treatment, Biological treatment, and Thermal treatment ⁴¹

³³York Region, 2009.

³⁴Halton Region, 2008

³⁵Niagara Region. Waste Management Services, 2010.

³⁶City of Hamilton, 2009b.

³⁷Conestoga-Rovers & Associates, 2007.

³⁸York Region Waste Management Backgrounder, 2005.

³⁹Halton Region, 2007.

⁴⁰MacViro Consultants & Jacques Whitford Limited (2005a), for details see Table 1.

⁴¹MacViro Consultants & Jacques Whitford Limited, 2006a,

Chapter 5

Discussion

This chapter presents the consolidated analysis of the case study findings and links these to the consulted literature. In Section 5.1 the importance of substantive and procedural equity in planning processes is discussed. The subsequent sections present the elements falling under the domains of efficiency, substantive equity, procedural equity, and context, as well as the linkages identified within each domain and across domains. Section 5.6 offers a discussion on power dynamics in relation to the developed framework. Sections 5.7 and 5.8 explain the implications of the findings for the planning theory discourse and environmental assessment process in Ontario. Lastly, Section 5.9 reflects upon several points that are not central to the objective of this thesis, but are considered important enough to be raised and acknowledged.

5.1 Understanding the importance of substantive and procedural equity and the role of financial considerations

The research questions posed in this thesis were informed by two assumptions formulated based on the inferences gained from the literature review. According to the first assumption, substantive and procedural equity influence public acceptance of thermal processing facilities. Some informants identified a clear link between procedural and substantive equity, noting that the open and inclusive planning process will result in more informed decisions. This conclusion reflects the claim made by Gross (2008) and Dietz and Stern (2008) that the outcomes reached by fair decision-making processes are more likely to be accepted by the public.

The second assumption about the necessity of making trade-offs between achieving a high degree of substantive and procedural equity and cost and time efficiency was declined by the informants. The justification for rejection differed between the representatives of the public and the representatives of the proponent. The representatives of the public referred to the imbalance of distribution of resources between the parties and pointed out the absence of intervenor funding. Therefore, the need to achieve a trade-off loses its topicality as all of the costs are borne by one party that consequently can even inversely affect the fairness of the planning process. In addition, the representatives of the public organizations noted that the quality, not the quantity, of the public consultations was important. Some argued that spending too much money on public consultations and on the Environmental Assessment (EA) process

in general may lead to a trap when the region or municipality could not reverse a decision after spending a significant amount of taxpayers' money with the voters subsequently expecting a solution to the problem. Such a situation may arise when the planning process continues for years and results in excessive expenditures.

The arguments proposed by representatives of the regions and municipalities also denounced the need for a trade-off. According to their explanation, those who want to make a decision will do so during the planned consultation sessions and additional sessions will not make any difference, especially for those who oppose a thermal processing option on an ideological level. The comments by the representatives of region and consultancy firms on the first and second assumptions were often linked to clustering the public into three groups: one group that supports the thermal processing option, a second group that is strongly opposed, and a third group that has not yet decided and is open to considering arguments and making corresponding conclusions.

The findings derived from this study confirm the heterogeneous character of the public (Petts, 1994b; Lahdelma et al., 2000; Dietz & Stern, 2008) and closely resemble the categorization of the public proposed by Susskind (1985). According to Susskind (1985), communities are comprised of those who can be described as *boosters* who favour almost any initiative that brings material benefits (e.g. in the form of tax revenue and new jobs); *preservationists* who usually oppose any project that may result in negative environmental impact or that may alter the community's character; *guardians* who stand in between the above radical groups and whose position depends on sound argumentation and fairness and transparency of the planning process; and *nonparticipants* who for a variety of reasons do not participate. Susskind (1985) notes that up to 50 percent of a community's population belongs in the guardian group. Lahdelma et al. (2000) assigns the public categorization by Susskind (1985) to one part of the stakeholders – *interest groups*. The other part consists of *standard stakeholders* - those “who have the legitimate responsibility to participate in the process” (Lahdelma et al., 2000, p. 597). According to Lahdelma et al. (2000), standard stakeholders include decision-makers, planners, experts, and analysts.

In contrast to Susskind's (1985) definition of *boosters*, case studies have revealed that those in favour of introducing thermal processing capacity are not driven by possible personal gains, but rather by the evidence that the proposed project can solve waste management problems. Moreover, constructing a thermal processing plant will enable a community to manage its own waste without imposing this on other communities for landfilling or other types of treatment. This different definition of *boosters* is noteworthy in relation to the discussion on how the actions driven by personal sentiments are overshadowed by the actions powered by more conceptual and fundamental beliefs. Similarly, in light of the case study findings, Susskind's (1985) interpretation of *preservationist* requires further clarification.

Those opposing thermal treatment plants mainly cite the unacceptability of having a thermal treatment option as the major reason for their resistance. This revelation contrasts with Susskind's (1985) explanation that preservationists are driven solely by concerns about possible health impacts and implications on a community's character. Such a discussion is more readily associated with the conventional explanation of NIMBY phenomenon. The case studies demonstrated that the opposition is not driven by an "unreasonable selfishness" of NIMBY activists (Susskind, 1985, p. 158), but rather by broader and more conceptual opposition towards thermal treatment option as such. Consequently, as the environmental issues gain stronger momentum on social, economic, and political arenas, public awareness and knowledge of the environmental problems raises, largely complements, and in some cases may replace the rational drivers of decision-making. As environmental and health issues are at stake, self-interest in terms of material well-being may no longer be the main factor for an environmentally-conscious public. The latter assertion reinforces the first assumption made in this thesis, particularly in terms of confirming the interest of the public in procedural equity of the planning process. This conclusion is in line with the discussion in the literature that for the last two decades the main focus of public response towards building waste disposal plants significantly moved from considering solely relational and selfish motives towards emphasising the perceptions of equity and justice (Lober, 1995; Wolsink & Devilee, 2009; Smith & McDonough, 2001; Petts, 1992; Baxter et al., 1999).

5.2 Substantive equity

The discussion on fundamental beliefs and conceptual opposition towards thermal processing facilities touches the substantive equity domain. In the present study, substantive equity was not associated solely with *spatial distribution* of facilities (siting), but was linked more to *fundamental opposition* towards thermal treatment as one of the waste management alternatives (See Figure 10). Interestingly, both those in favour and those against thermal treatment projects agree on this assertion. However, it is also noted that NIMBY is still a very strong factor as people most react when an issue directly concerns them. At the same time, representatives of the public and community organizations note that their work with the public resulted in raising environmental awareness about different waste management options.

The association of substantive equity with facility location was the strongest in the Niagara-Hamilton case, where the informants linked this issue to siting polluting facilities in disadvantaged communities. Such a conclusion can be traced back to the experience of hosting a polluting SWARU incinerator in Hamilton. In the latter case, the link between the facility location and its possible negative impact on human health and the environment is strongly perceived.

The fundamental opposition towards Energy-From-Waste option explains the fact that *compensation* is often not viewed as an effective solution (See Figure 10). Some informants noted that if compensation is offered, this implies that there is something wrong with the facility. Moreover, most of the informants negatively responded to the possibility of both financial and in-kind or public good compensation. Few informants relate compensation more to the landfill siting cases rather than thermal treatment plants, as the latter are not expected to affect property values. The evidence from the case studies conflicts with the assertion by Claro (2007) that compensation is a realistic mechanism to reach equal distribution of burden by transferring resources to those who host the community. The conclusions over effectiveness of compensation also contrast with the explanation by Gallagher et al. (2008) that compensation is able to reduce public opposition towards the proposed plant. It is noteworthy that, in some cases, compensation programs may become part of the broader document signed between the proponent and community. Such documents are referred to as Impact and Benefit Agreements (IBAs) and have been used in Northern Canada to establish formal relationships between resource extraction companies and First Nation communities (see Langton et al., 2006; Caine & Krogman, 2010; Hitch, 2010; Sosa & Keenan, 2001). The idea behind IBAs intends to minimise the negative impact of commercial activity on communities and the environment and ensure that local communities receive benefits from the development (Sosa & Keenan, 2001). Studying compensation schemes from this angle could contribute towards broadening the discussion on feasibility and effectiveness of various types of compensation mechanisms, particularly regarding municipal solid waste management facilities.

When asked to define a *fair outcome*, some informants explained that this represents the best solution for the existing problem from various perspectives for both short-term and long-term that was reached by different groups based on provision of accurate and full information. This explanation agrees with the definition of substantive equity by Smith and McDonough (2001) – an outcome that is personally favourable for the community members, an outcome that is perceived fair in relation to future generations, and an outcome that will not result in negative impacts on the natural environment and human health.

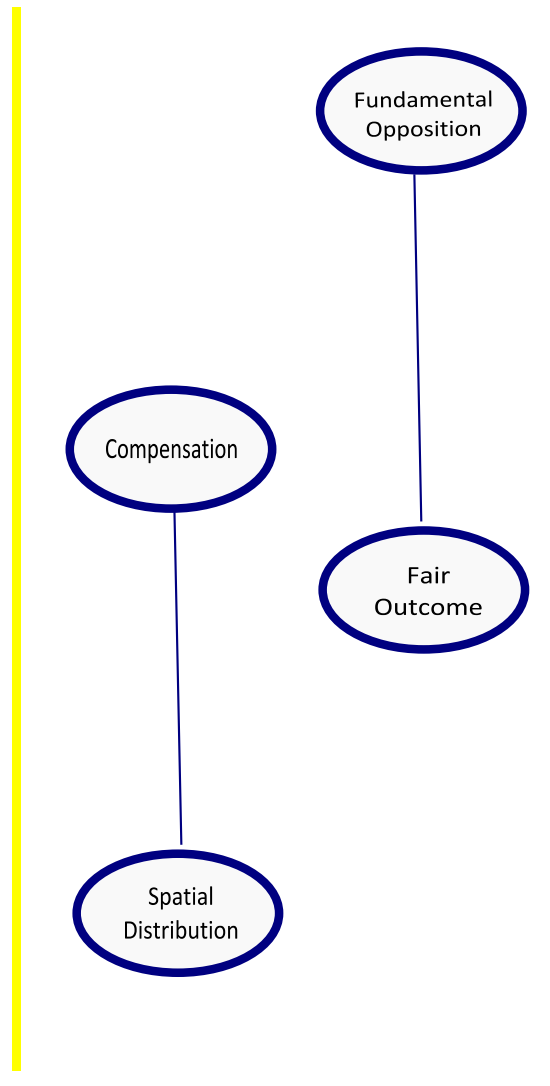


Figure 10 Substantive equity domain

5.3 Procedural equity

A central element in the procedural equity domain is revealed to be *the early and extensive public participation* in the planning process. The main criticism voiced by the representatives of the public was related to the failure to involve the public in the early stages of the planning process and define the alternatives with non-bias and open approach, rather than starting the public consultation process with the chosen alternative in mind. This finding identifies the linkage between the element of early involvement and the perception of the *impartial* planning process (See Figure 11). Representatives of the public often felt that the decision had already been made to pursue thermal processing practices when the discussions with the

public first began. A similar criticism is found in the written comments submitted by public representatives on the draft Terms of Reference (ToR) document in the Niagara-Hamilton case. One letter from the resident of the Niagara Region reads:

My strongest concern about the draft ToR comes through observation and participation in Wasteplan activities this past year. It is apparent that the decision has already been made regarding a Waste-to-Energy facility as the only alternative to landfill. This Draft Terms of Reference seems just a formality – paperwork catching up to the decision – if you will. I realize much work has gone into the study so far, but I feel that not enough effort has been given to creating a waste disposal system that revolves around maximum diversion (Niagara-Hamilton WastePlan, 2004b, p. 8).

The concern about lack of neutrality can be linked to the research findings proposed by Gross (2008) and Tyler (1989) who state that the judgments of procedural justice are influenced by the perceptions of the neutrality of the decision-making process and the impartiality of decision-making authorities. Perceptions of neutrality imply that “in any particular situation people will be concerned with having an unbiased decision maker who is honest and who uses appropriate factual information to make decisions” (Tyler, 1989, p. 831). Concerns over neutrality can be linked to the broader notion of trust. Petts (1994a) names the lack of trust in regulatory agencies as well as in the private sector to manage the facilities effectively as one of the factors contributing to public opposition.

While discussing the early involvement of the public in the planning process, it is noteworthy to touch upon the development of the Terms of Reference (ToR) which is an initial stage of the EA process. The ToR serves as a guideline for further steps by identifying the preferences and laying out the public consultation process. Consequently, as the public takes an active part in determining the process through developing a ToR, some doubt exists regarding how one can criticize a process that one has developed.

However, early and extensive public engagement in the planning process seems to be difficult to realize. The studied cases revealed that public *attendance* in the early stages of public consultations is usually very low; this highlights the lack of the awareness and interest among the general public towards more strategic discussions. This finding can be related to an explanation by Warriner (1997) that the affected public is not always an interested public, therefore it is not committed to provide input and participate in the planning process.

Providing more information and raising public awareness over the proposed project through conducting an active *community relations* campaign could be one method to address this issue. The other

solution could be to employ *internet-based tools* more extensively in order to create an interactive and inclusive platform for public engagement. With the advancement of social networking sites and different web applications, the implications of using internet-based tools in planning have been explored (see Evans-Cowley & Hollander, 2010; Shipley & Feick, 2009; Gordon & Koo, 2008). While these new technologies are not without their challenges, scholars agree that internet-based tools have potential “to elevate the public discourse in an unprecedented manner” (Evans-Cowley & Hollander, 2009, p. 397) and put “enormous amount of power in the hands of ordinary people” (Shipley & Utz, 2011, p. 8).

In terms of gaining a broader idea about public stances, some informants noted the effectiveness of surveys, referendums, or internet polling; however, few suggested that the public should be first educated about all aspects of the proposed options in order to make informed choices. Others claimed that survey questions may be directed to gain the desired outcome that will result in inaccurate survey results.

Representatives of the public who participated in public consultation sessions during the development of the EA ToR for the Durham-York case had mixed reactions to the proposal of having a web-forum or an on-line poll as one method of gathering information from the public. Some of these comments are presented below (MacViro Consultants & Jacques Whitford Limited, 2005f, p. 14; MacViro Consultants & Jacques Whitford Limited, 2005g, p. 12).

- Do you have information on how many residents in Durham actually have access to the web or e-mail?
- Computers have become a staple for the vast majority of the public. As a tool it is by far the most cost effective for your program.
- E-mail is a powerful inexpensive tool.
- On line might be good for the younger or well-educated people. Myself along with a fair amount of people my age (over 70), computing is often difficult.
- Time is tight, we commute, we want to spend time with our kids. Web forum is easiest.
- It would be wasting my time with the other methods. This would allow me to take my time, but it would miss out those who are not interested.

The evidence of the effective use of web surveys has been demonstrated in heritage planning (see Shipley & Feick, 2009). Web-based surveys were considered to be relatively inexpensive, effective in reaching out

to a wider audience, and convenient for respondents (flexibility of answering questions from any location at anytime) (Shipley & Feick, 2009).

The issue of early and extensive public involvement can be linked to the suggestion to tap into *local expertise* and actively *engage the youth*. The inclusion of youth in planning processes was particularly stressed by the informants, as the younger generation is better educated about and more receptive to environmental issues. In addition, youth need to be involved in long-term decision-making as they will eventually take over this responsibility. The importance of tapping into local expertise has been discussed in the literature, especially in relation to the trend of prioritising expert knowledge over local expertise (Davies, 2001b; Weidemann & Femers, 1993; Karvonen & Brand, 2009). Much has been said about the importance of local knowledge and the need to appreciate and incorporate this into decision-making processes. In planning theory discourse, the relationships between an expert planner and his/her client is at the centre of the transitive planning approach. Conceptualised by Friedmann (1973), transactive planning advocates for mutual learning, as a result of which new knowledge is born (See Section 5.7). The element of local expertise, therefore, is an important element of the procedural equity domain and is linked to the need for having local voices heard and considered (See Figure 11).

The interviewees agreed that the proponents adhered to the legal requirements; however, the representatives of the public noted that even when all of the formal procedures are carried out, the proponents (regional staff) are able to influence the process by providing incomplete information or by controlling meetings. The *provision of full and accurate information* is perceived to be crucial for understanding the judgement of the other party and also for mitigating tensions among the opposing sides (See Figure 11). However, in cases of highly controversial projects or cases that have personal importance, there may be a tendency of judging the legitimacy and accuracy of information based on whether it supports or opposes one's position on the issue and whether it corresponds to one's cultural values (Kahan & Braman, 2003). Additionally, when most of the information is produced (e.g. reports) and provided by one party (e.g. proponent), the issue under discussion may be framed in a way so as to encourage a certain course of interpretation (Dietz & Stern, 2008).

The provision of full information is directly linked to the notion of *language* in which the information is provided. The representatives of the public often criticize the use of terms other than "incineration" while making announcements or describing the proposed project. The opponents criticized the effort of "re-branding incineration into energy-from-waste" or "sugar coating". During one of the public meetings, the public referred to the term "thermal treatment" as being "disingenuous" and proposed to "call it what it really is: burning garbage" (Ogilvie, Ogilvie & Company, 2007b, p. 21, Ogilvie, Ogilvie & Company, 2007c, p. 45; Genivar, 2007, p. 34). As a response, the use of the term "thermal treatment"

was justified by its wider meaning that includes not only incineration technology but also gasification, pyrolysis, and plasma gasification practices (Genivar, 2007).

The issue of providing full and accurate information, especially by using *different data sources* and references (with resulting conclusions that are differing and often conflicting) as well as through media coverage is closely linked to the possibility of *conflict and tension*. Such a dichotomy of information makes it very difficult for those who have not yet made a decision to determine their stances. Moreover, similar controversy may undermine the trust in the project, as it is unclear who to trust or which report is more accurate.

One way of mitigating or possibly avoiding tensions and conflicts is *to prepare the municipal staff* to deal with controversial situations. A similar approach was planned in the Region of Halton. Such actions speak about the desire of the region or municipality to lead constructive and transparent dialogue on the proposed project. Despite the desire to mitigate possible conflict, the informants asserted that the existence of tension is inevitable as people become very emotional when they perceive the direct link between the proposed project and their health and well-being. However, some noted that tension does not always have a negative connotation and that healthy controversy is even necessary for having a good EA process.

Some informants noted that mitigation of conflict is possible by being *transparent* and answering questions truthfully, even if the answer is “I don’t know”. In general, the words “transparent” and “transparency” are often used by the interviewees in relation to the planning process. The same can be said about the reports and summary documents describing the EA process. For example, in the beginning of the summary report of one of the public meetings in the Durham-York case, an independent facilitator explained that the aim of the workshop was to hold a discussion that is “fair, transparent, balanced and informed”, whereas “fair” implies when “everyone will be treated with respect, and their opinion will be given a fair hearing”, and “transparent” means that summary reports of the workshops will be prepared and released (Ogilvie, Ogilvie & Company, 2007a, p. 4).

The actual *format of public meetings* is named as an important element for procedural equity. The importance of face to face interaction in a small group and in-depth discussion of the project is favoured in some cases, compared to large town hall meetings. The suggestion is to conduct more meetings with people in their neighbourhoods in a more informal atmosphere. However, it is also noted that since the meetings should be recorded, it would be difficult to satisfy this requirement in case of the small, more informal meetings. The other obstacle for conducting small-group meetings is the fact that as the planning process proceeds, the number of participants increases, thus making it more difficult to hold workshops. Meanwhile, while some prefer a workshop format, others criticise it. For example, opinions

were divided in the case of the Niagara-Hamilton waste plan on how the workshops were organized and conducted. Some considered the workshops to be very well organized and helpful, while others said that they were rushed and did not provide the possibility for representatives of the public to ask questions and fill in the distributed workbooks. After reviewing the scholarship of the last two decades on public consultation in planning processes, Shipley and Utz (2011) distinguished the most common approaches of public engagement. These approaches include public meetings, focus groups, citizen juries, scenario workshops, and visioning exercises. The findings of this thesis suggest that the two most widely used formats of public engagement are town hall meetings and workshops. The same can generally be said about the literature on planning waste management facilities. There is much less discussion about the application of citizen juries, focus groups, and visioning exercises. Whatever the manner of public engagement, it is noteworthy to remember that such meetings may serve different purposes – some aim to provide information while others seek feedback and comments or try to build consensus through initiating discussions. Therefore, the format of a meeting should correspond to its purpose (McComas, Besley, & Black, 2010). The other issue that emerged from the cases is the choice of the *venue for the public consultation* sessions. It was suggested by the informants to hold public meetings in close proximity to the affected residential areas or at least be accessible by public transport.

In the studied cases, the possibility of having opportunities to voice concerns and receive response was linked to avenues that the planning process provides for wider civic engagement. Therefore, the procedural elements of *voice* and *consideration* were mainly linked to the questions of chosen meeting formats and additional tools to enhance public participation (e.g. Internet). These connections fall under the broader discussions regarding the importance of direct citizen participation for democratic society and the necessity of creating opportunities for public participation in democratic governance (Mason, 1998). In addition, the issues regarding voice and consideration can be associated with the conceptual discourse in planning theory (e.g. collaborative planning) emphasising the need for creating an environment where multiple voices can be heard and incorporated in the decision-making process (see Healey, 1997).

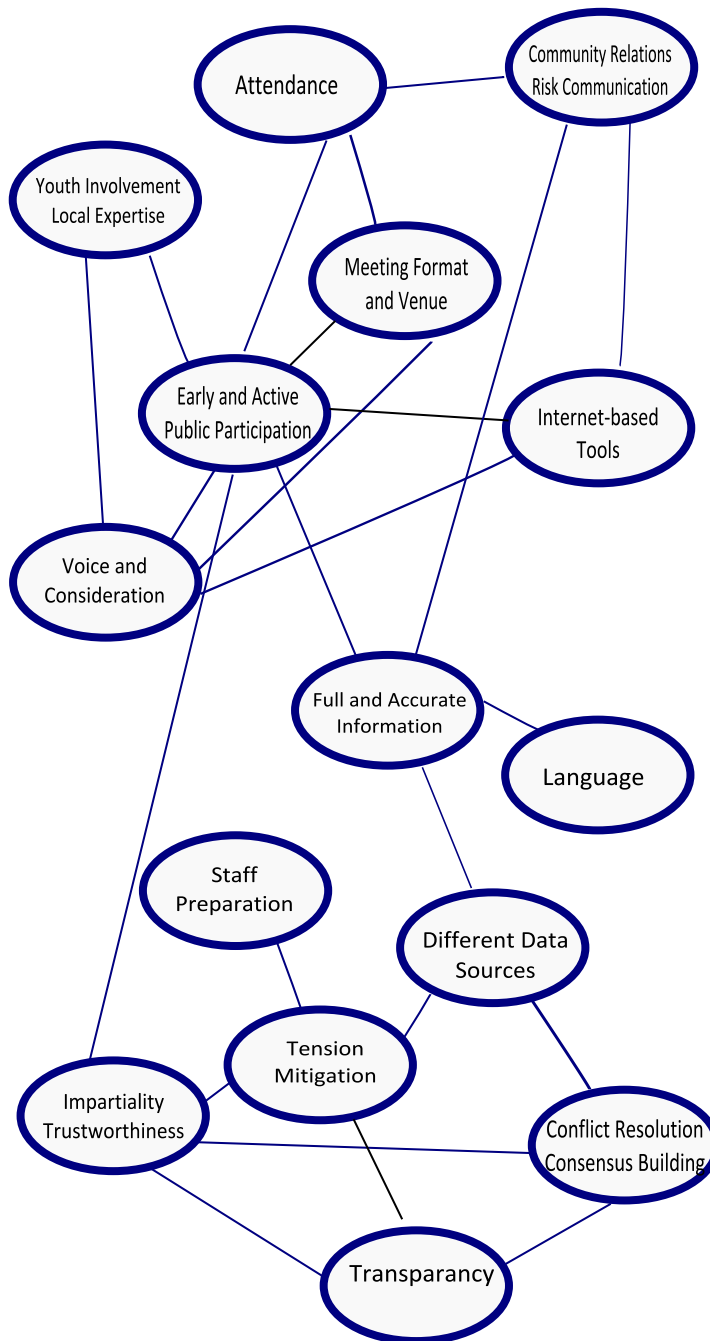


Figure 11 Procedural equity domain

5.4 Contextual elements

The role of local politicians emerged as one of the strongest contextual elements. Informants from all cases noted the important and decisive roles that local politicians played in making decisions regarding the thermal processing option. This finding is in line with the conclusions offered by Lawrence (1996) that political opposition or support is instrumental in defining the outcome of the planning process. This conclusion is also strengthened by the fact that in the studied cases, political changes in the region altered the priorities over the energy-from-waste option. Both representatives of the public and representatives of the region and municipalities emphasized the central role of politicians. The latter noted that the final decision is made by politicians based on the information they have and the arguments provided by the opposing parties. Elevating the discussions around a thermal treatment project to a political realm is seen as the most effective instrument in influencing the process and its outcome. However, it is believed that the pressure experienced by local politicians makes it more difficult for them to come to a decision. The situation may be even more difficult if the councillors represented in the regional council belong to the local council of the ward where the facility is going to be located (e.g. Clarington).

The *institutional arrangement* of the region is closely linked to political factors. This issue is especially obvious while comparing Halton and Durham-York regions. The majority of the informants noted that in the case of Durham-York region the chair - who is appointed rather than directly elected - is less constrained to make an unpopular decision. Despite this institutional arrangement, it is believed that the presence of a *political champion* is necessary for a successful outcome of the planning process.

Not only has the role of local politicians emerged as an important contextual element, but also the role of the broader *policy priorities and directions* set at the provincial level. In the Durham-York case, it was mentioned that the regions lacked provincial guidance during the planning process as the province did not have corresponding experience and knowledge. This was the first EFW facility to be built in Ontario in approximately two decades. However, due to the constructive cooperation with the province, it was possible to build the needed expertise. Most of the informants agreed that the local actions at the level of municipalities should be guided by provincial priorities around waste management options. Some argued that more emphasis on waste reduction is required on all levels - municipal, provincial, and federal.

One of the important contextual elements that emerged through investigating the cases is the *experience of collaboration* between the region and various environmental and advocacy groups. In the case of the Niagara-Hamilton thermal treatment project, the informants stressed that when discussions started on a possible new facility, a certain level of trust already existed between the municipality and community groups. Interestingly, this trust was a result of what could be initially regarded as a very antagonistic

relationship –community and environmental groups raised their concerns about the polluting SWARU facility. However, over time the harsh dialogue between the municipality and community groups translated into a more constructive cooperation. This conclusion relates to the broader scholarly inquiry on the role of social capital in enhancing collective action. In his study of twenty regional governments established in Italy in the early 1970s, Putnam et al. (1993) concludes that voluntary cooperation is more likely to take place in communities that have pre-existing social capital. Similarly, Dietz and Stern (2008) argue that the emergence of social capital may increase civic engagement, capacity, and competence of the community/advocacy groups, and may foster more effective public participation process. As the authors explain, increased interaction fosters the creation of social networks, reciprocity, and trust that together constitute social capital. Duane (1999) names the tradition of collaboration as the “fertile soil” (p. 57) that may allow more expeditious action. Given the importance that the existing scholarship assigns to social capital in framing collective actions, further research is warranted to investigate the role of social capital in strengthening procedural equity of planning processes.

In order to build an experience of collaboration, community and advocacy groups should exist that have the capacity to be actively engaged in the policy making process. Therefore, building the *capacity of non-government and community organizations* can result in a constructive collaboration between the region/municipality and the community or advocacy organizations that will eventually result in a more informed and effective decision-making process. In addition, the capacity of community and advocacy groups is linked to the political domain (See Figure 12). The latter conclusion is based on the findings from case studies in which moving the discussions around a thermal treatment project to a political realm proved to be the most effective instrument in influencing the final outcome. Therefore, the way community and advocacy groups are able to communicate with the politicians, explain and justify their position, and work together may have significant implications on the planning outcome. In recent years, the attention drawn to the emergence of place-based planning efforts speaks to the need for having strong grassroots capacity (see Farnum & Kruger, 2008; Mason, 2008). Mason (2008) names this the “quieter revolution” in land use management that highlights “place-based, public-private, multistakeholder approaches” (p. 3).

The *community characteristics* were named as one of the contextual elements, especially in relation to community response to the proposed facility. The informants noted that age, level of education, and experience of visiting places where thermal treatment plants are widely accepted (e.g. Northern Europe) could affect reactions to the proposed project. Consequently, the characteristics of the community may be linked to the risk perceptions, as background, education, or travel experiences may influence how thermal treatment is perceived. The characteristics of the community can be also related to the general

capacity of grassroots action and the collaboration efforts between the community groups and the region or municipality. This discussion affirms the importance of community context during planning processes for noxious facilities, including waste management plants.

The other important contextual element is the *perceived risk to human health and the environment* that proves to be the strongest force for fuelling opposition towards thermal processing facilities. This finding resonates with the conclusion by Reams and Templet (1996) that with higher quality of life and education, the public has become less tolerant of environmental risks. Perceived risk can be linked to the *previous experience of hosting and managing waste disposal facilities*. This point is especially obvious in the case of the city of Hamilton, where strong public opposition towards thermal treatment plants was closely associated with the experience of hosting the polluting SWARU incinerator. A similar conclusion is offered by Gallagher et al. (2008) who claim that public perceptions of risk are influenced by previous experiences of hosting a waste disposal facility.

The previous experience of hosting a waste disposal facility is related to management issues. For example, in case of the SWARU, the facility was not only a heavy polluter but it was also poorly managed. As informants noted, the protection of the environment does not stop once the EA process is over, since facilities require constant monitoring and upgrading. The waste management processes are regulated by corresponding regulatory mechanisms, such as EPA Regulation 347 on Waste Management that, among others, sets standards for waste disposal sites and generation facilities, on-site thermal treatment equipment, and hospital incinerators. Other relevant regulatory mechanisms include EPA Regulation 419/05 on Local Air Quality and EPA Regulation 101/94 on Recycling and Composting of Municipal Waste. Consequently, the management of waste treatment and disposal facilities adhere to existing legal requirements, although some argue that it will not make much difference for those who oppose an EFW alternative.

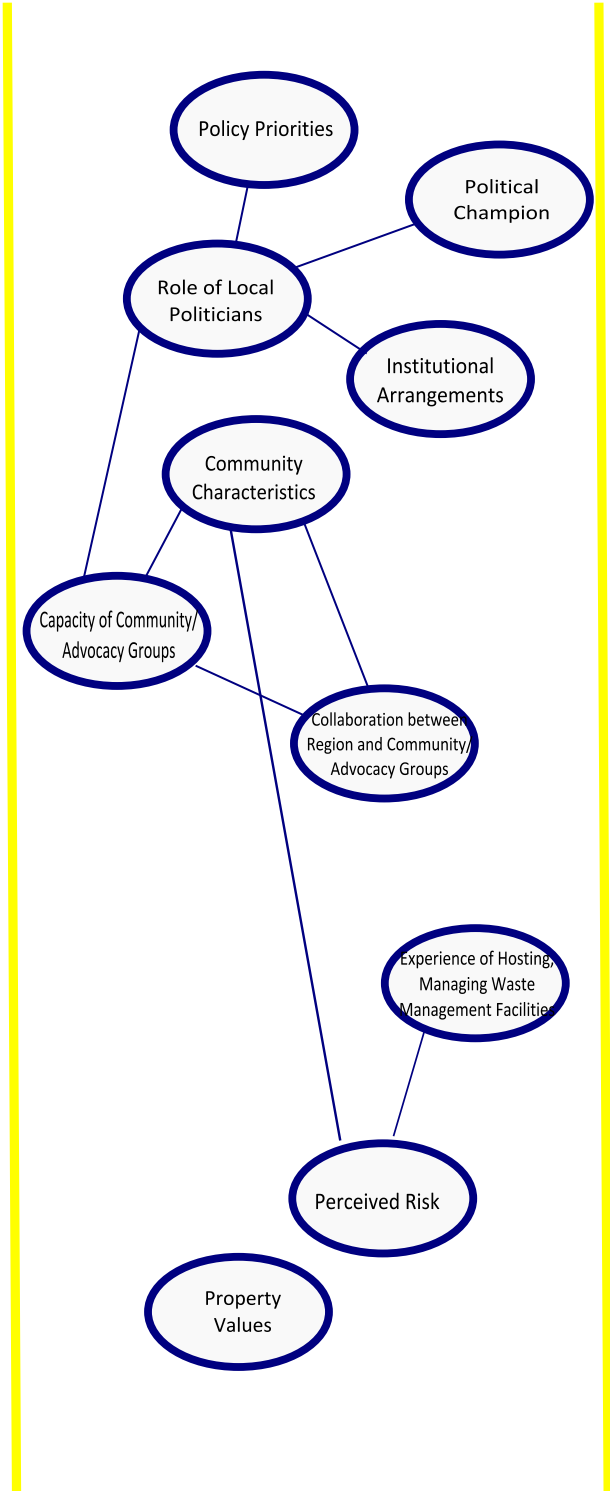


Figure 12 Context domain

5.5 Cross-domain linkages

Although it has been acknowledged that the planning processes for noxious facilities such as landfills and incinerators is a costly and time-consuming process (Baxter et al., 1999; Gallagher et al., 2008), the question of efficiency has not been explored from an equity standpoint. The current study revealed that spending more money on organizing more public consultation events will not result in a fairer process. As informants noted, resources are usually concentrated in the hands of one party; therefore, increasing spending on the public participation process will not result in more equitable process, unless other parties have their share of resources to spare. In addition, the case study findings reveal that those who oppose the proposed facility based on more ideological grounds are not expected to change their opinion, even if the public consultation campaign is expanded. Consequently, as Figure 13 shows, the efficiency domain is linked with the element of “fundamental opposition” and “capacity of advocacy and community groups”. Interestingly, given the fact that the second assumption posed in this research has been denied (see Section 5.1), the direct linkages between the efficiency domain and procedural equity have not been obvious.

A linkage between the substantive equity domain and context was revealed in relation to the characteristics of the community and the fundamental opposition towards the proposed project. The informants noted that such parameters as education level, knowledge about different waste management methods, as well as travel experiences to places where thermal processing plants operate may contribute towards defining the openness of the community at large to thermal treatment option. The linkage between the characteristics of the community and the reaction to the proposed project can be discussed in line with the conclusions about the heterogeneous nature of the public offered by Susskind (1985), Petts (1994b), and Dietz and Stern (2008) as presented earlier in this chapter. However, in order to have an in-depth discussion on this topic, more data is needed regarding the demographics of the community under study. In one of the earlier attempts to study the correlation between community demographics and attitudes towards waste management facilities, Williams and Matheny (1998) concluded that demographic differences exist between those who oppose hazardous waste disposal facilities “on principle” and those who oppose such a development only when it is located nearby (p. 172). Williams and Matheny (1998) draw on the surveys conducted in the 1980s in Massachusetts (see Portney, 1991). These surveys revealed that those with NIMBY sentiments tend to have higher levels of income and education as well as Republican Party identification, whereas those who oppose hazardous waste disposal facilities on principle are more likely to have lower or middle income, be concerned about health risks from the facility, have children, and are mostly females. Although this evidence is important, it cannot be

deemed universally true. However, this reveals the demographic differences between those who have different attitudes towards waste management facilities and their location. Therefore, the characteristics of the community can be linked not only to the expressions of fundamental opposition, but also to the existence of NIMBY phenomenon. Overall, this discussion adds to the point that public opposition is a complex phenomenon that should not be reduced solely to NIMBY sentiments or siting considerations.

Another linkage identified between the domains of substantive equity and context relates to the influence of past experiences of hosting and managing waste management facilities on public stances. In particular, linkages are established between the element of past experiences and fundamental opposition. These linkages are interpreted from two positions by the informants. The first position explains that after experiencing the negative impact of polluting facilities (or its mismanagement) the communities are usually strongly opposed to host new facilities. The City of Hamilton - that hosted SWARU facility - is a vivid example of this trend. The second explanation relates to the fact that fundamental opposition is based on the reluctance to introduce thermal treatment option as such, in spite of its technical or managerial merits or shortcomings.

In a substantive equity domain, considerations on spatial distribution of thermal treatment facilities are linked to the consideration on perceived risk and property values. The connection between the location of the facility and perceived risk regarding a facility's possible negative impact on human health and the environment has been extensively discussed in the literature. In fact, the NIMBY phenomenon describes this connection – a negative response by the members of local community to the facility siting decisions because of the perceived risk to the environment and human health. On the other hand, the connection between the location of thermal treatment plant and the issue of property values is not strongly established. The informants associated variations of property values more with the existence of a landfill than with a thermal treatment plant. Although it was argued that EFW plants will not affect property values, the concern was expressed, particularly in cases where farmlands are located around a planned facility. This implies that the value of the farm products may decline and thus negatively affect the financial situation of the local farmers. The literature does not mention possible economic implications of the EFW facilities on farmlands, but focuses on the property values of the surrounding residential areas, possibly because incinerators are mostly built close to densely populated urban areas.

The study identified linkages between the perception of a fair outcome and the provision of full and accurate information. The informants believed that one of the main prerequisites of finding a best possible decision is the provision of full and accurate information about the planned project. The format and the content of the presented information have also been linked to the perceptions of risk. The notion of full and accurate information and its role during planning processes has been discussed in previous

sections of this chapter. However, it is important to note that the discussion on information also implies the media coverage of the ongoing planning processes. The informants assigned significant importance to the role that media can play in informing and educating the general public about thermal treatment option, although the views of the representatives of the regions and environmental groups differed on the merits of media coverage during the studied planning processes.

The capacity of community and advocacy groups to participate in the planning processes is believed to affect the level of participation and interaction. By capacity, the informants meant financial and human resources that these organizations need in order to provide feedback and be actively engaged in the process. The informants representing public and community organizations noted that they lacked the capacity to fully comprehend and analyse technical reports provided by the proponent. This finding strengthens the point that in order to make a competent judgment the public needs to have not only full access to information, but also the ability of interpretation (Webler & Tuler, 2000). Whereas the general public does not often have the competence and resources to analyze the details of the technical reports, the provision of information by one party may only be regarded as a potential tool for manipulation. Even when public representatives have knowledge and skills to analyze relevant information, they seldom have access to peer-reviewed journals (subscriptions to such journals are quite expensive) where scientific research is published nor to the specific technical reports (Dietz and Stern, 2008). In this regard, the need for intervenor funding may be discussed in a new light – as a way to empower the public to provide competent feedback and critical analysis of a proposed project. This discussion relates to the provision of resources and the issue of trade-off that has been discussed earlier. More importantly, the question on capacity of various grassroots organizations links with the discussion on power distribution during planning processes (see Section 5.6).

The challenge of engaging the broader public in more strategic discussions during the earlier stages of the planning process affirmed the importance of having a strong capacity of community and advocacy groups that could participate in policy making and thereby bring grassroots and local knowledge to the discussion table. The importance of having an active presence of non-government, community, and advocacy groups was revealed as well through discussing the issue of possible conflicts and trust-building between the parties.

The study revealed that previous experience of collaboration between the region/municipality and community groups and organizations can create a platform upon which more effective and meaningful participation processes may be built. Once such experience exists, a certain level of trust is developed and it is easier to begin consultations and discussions on a new project. Moreover, in such cases severe tensions and conflicts are more probable to avoid as the representatives of both sides know and trust

each other. The informants stressed that previous collaboration helped build trust between the parties and avoid possible conflicts. This assumption is in line with the conclusions offered by Earle and Siegrist (2008) who note that in the case of highly controversial issues, rather than starting with implementing procedures and presenting arguments, it is essential to establish the trust “based on morally important, commonly held values” (Earle & Siegrist, 2008, p.1409). The identified linkage between the experience of collaboration and trust-building echoes the broader scholarly discussions on the role of social capital in framing collective action (see Putnam et al., 1993). Particularly relevant to this discussion is the conclusion offered by Duane (1999) that social capital generation can be characterised by the positive feedback loop – “trust and cooperation generated further trust and cooperation, while mistrust and defection generate further mistrust and defection” (p. 58).

One of the key contextual elements identified in this study was the role of local politicians. In general, the influence of political interests and priorities was closely linked to the final decision-making stage, rather than the decision-making process itself. The connections, therefore, can be assumed between the political elements of the context and substantive equity domain. These connections, as well as the possible influence of politicians on the planning process, need further investigation. Of particular interest is the exploration of human agency in the political realm and its role in shaping the final outcome. This array of research could provide more insights into the contextual element revealed during the case studies - the figure of a *political champion*.

A graphical presentation of the various elements falling under domains of efficiency, substantive equity, procedural equity, and context, as well as the linkages within and across domains can be viewed in Figure 13 (linkages within domains are shown in dark blue colour and linkages across domains are highlighted in pale blue).

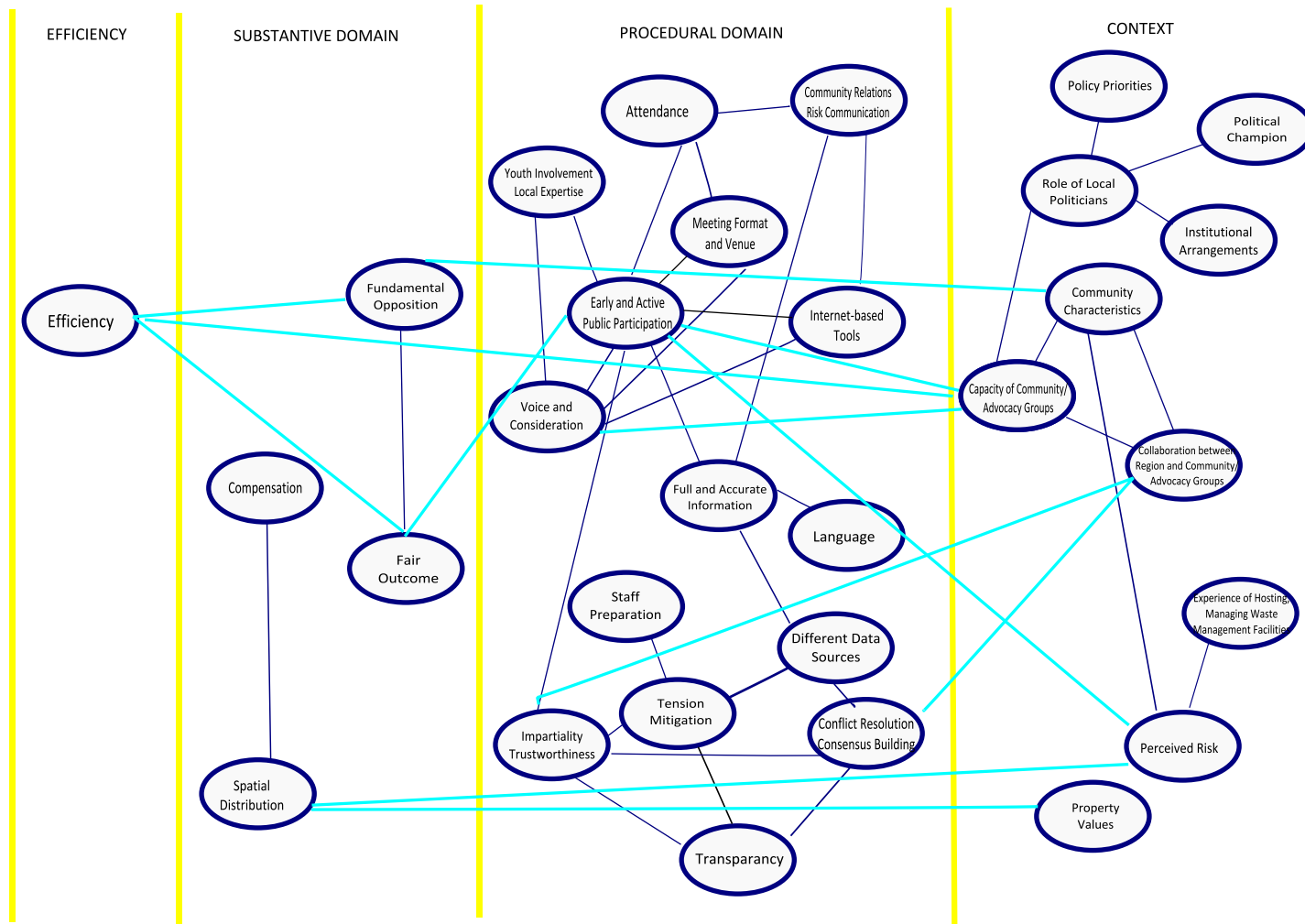


Figure 13 Cross-domain linkages

By looking at the broader picture unifying the four domains (see Figure 13), certain clusters of elements can be identified. For example, within the context domain the elements of capacity of community and advocacy groups, characteristics of community, and experience of collaboration are closely linked to each other. Moreover, these elements transcend the frames of context domain and reach out to the domains of substantive and procedural equity. These connections, discussed in the previous chapter, speak to the importance of community context while studying equity considerations. The contextual elements can be equally applicable for a wide range of waste management facilities. The main idea behind considering context is that each community is different and it is important to acknowledge and consider these differences. There is a general tendency to discuss particular planning processes without giving due consideration to the wider context. This thesis reveals that the context influences public's stances, perceptions, and priorities when it comes to equity considerations. Webler and Tuler (2002) propose viewing public participation as being situated between preconditions and outcomes; that is, public participation practices are influenced by their preconditions and result in certain outcomes that become preconditions for the next public participation process. Consequently, planning practices can be analyzed not only as being embedded in their context, but also as a part of the temporal cycle that includes the preconditions (context), the planning process itself, and its outcomes.

Another cluster that can be seen is the one formed around the element of early and extensive public participation. This cluster is mainly contained within the procedural equity domain, although it has connections with the elements in context domain. This conclusion speaks to the importance of engaging the public early in the process and providing opportunity for extensive participation. It should be noted that in studied cases, early involvement implied public engagement during the long-term planning of municipal solid waste management systems; that is, the prioritisation of different waste management alternatives and finding the best combination of options given the local circumstances. This discussion relates to the notion of Integrated Waste Management approach which refers to constructing an integrated, holistic system where different waste management options are combined in order to come up with the best possible solution.

The following table offers a summary of the themes and elements belonging to these four domains, as well as a brief explanation of the research contributions to the analytical framework initially presented in Section 2.6.

Table 6 Summary of themes and elements falling under the domains of substantive and procedural equity, efficiency, and context including the findings of the research

Domain	Theme	Element	Reference/Source	Research Findings
SUBSTANTIVE EQUITY	<i>Desired outcome</i>	Outcome that is favourable for community members, outcome that is perceived fair in relation to future generations, outcome that will not have negative impacts on the natural environment and human health	Smith & McDonough, 2001; Gerard, 1994, Kasperson & Dow, 1991	Substantive equity is not strongly associated with spatial distribution of waste treatment/disposal facilities; rather, it is linked to the <i>fundamental opposition</i> towards thermal treatment as one waste management option. In certain cases substantive equity can be associated with the siting of a facility (especially in disadvantaged communities).
		Spatial distribution of facilities	Baxter et al., 1999; Lawrence, 1996	
	<i>Compensation</i>	Roles and effectiveness of compensation schemes	Gallagher et al., 2008; Kikuchi & Gerardo, 2009; Schively, 2007; Lidskog, 1998; Lulloff et al., 1998; Bacot et al., 1994; Jenkins-Smith & Kunreuther, 2001; Sjoberg & Drottz-Sjoberg, 2001; Chung et al., 2008; Rabe, 1992; Lawrence, 1996; Petts, 1994b; Susskind, 1985	
Financial vs. in-kind or public good compensation		Claro, 2007; Jenkins-Smith & Kunreuther, 2001; Sjoberg & Drottz-Sjoberg, 2001		
PROCEDURAL EQUITY	<i>Representation (broad involvement)</i>	Early and extensive public involvement	Rabe, 1992; Joos et al., 1999; Gross, 2008; Lahdelma et al., 2000; Lawrence, 1996; Smith & McDonough, 2001	<i>Early involvement of the public</i> in the planning process is considered to be one of the most important elements of procedural equity.

Domain	Theme	Element	Reference/Source	Research Findings
				Tapping into the <i>local expertise</i> more actively and increasing <i>youth participation</i> in the planning process could activate public participation.
	<i>Voice</i>	Participation in decision-making process	Smith & McDonough, 2001; Gross, 2008; Webler & Tuler, 2000; Illsley, 2003	Enabling the public to voice their concerns and suggestions through <i>internet-based tools</i> (e.g. interactive web-sites) could stimulate public participation in the process.
	<i>Consideration</i>	Opportunity for concerns and issues to be raised and responded to	Smith & McDonough, 2001; Gross, 2008	
	<i>Environmental mediation</i>	Conflict resolution/consensus building	Lawrence, 1996	All these elements were present in the case studies; however, particular emphasis was made on <i>transparency</i> of planning and decision-making processes and the <i>impartiality</i> of the decision-making authorities.
		Transparency of decision-making and decision-execution (including financial transparency)	Joos et al., 1999	
		Impartiality and trustworthiness of decision-making authority	Gross, 2008; Petts, 1994b; Lober, 1995; Baxter et al., 1999; Hunter & Leyden, 1995; Ibitayo & Pijawka, 1999; Bacot et al., 1994;	
	<i>Public relations</i>	Community relations – the establishment and maintenance of a general awareness in the community about waste management issues	Joos et al., 1999	Aside from providing general information on waste management issues, the theme of public relations is linked to the provision of full and accurate information about the planned project. The latter particularly relates to the risk communication element.
		Risk communication (any purposeful exchange of information about health or environmental risks between interested parties)	Petts, 1992; Petts, 1994b; Covello, 1991	
	<i>Information provision</i>	Possibility of receiving adequate information	Besley, 2010; Gross, 2008; Illsley, 2003; Petts, 1994b	<i>Provision of full information</i> about the project and its possible impacts is considered significant not only for making decisions, but also for understanding judgments of the other party. However, the available
	<i>Language</i>			

Domain	Theme	Element	Reference/Source	Research Findings
				information may be conflicting, which makes it difficult to reach consensus. <i>Language in which the information is provided</i> is also deemed important and contributing to procedural equity.
	<i>Format and venue for public consultations</i>			Format of the public consultations as well as the accessibility of the venue was considered to be an element for procedural equity. Face-to-face interaction in a small group setting was favoured over large meetings. The possibility of conducting surveys, referendums, or internet polling was also named as options for learning the position of the broader public.
EFFICIENCY	<i>Efficiency</i>	Financial expenses Time required (time-consuming process) Personnel and other agency resources	Sewell & Phillips, 1979; Warriner, 1997; Baxter et al., 1999; Gallagher et al., 2008	Although cost considerations are deemed important, the assumption that more spending will contribute towards strengthening substantive and procedural equity is not supported.
CONTEXT	<i>Perceived risk</i>	Perceived risk in relation to environmental and health impacts, as well as uncertainty about safety, regulation, and the nature of the waste stream	Elliott, 1998; Petts, 1994b; Sjoberg & Drottz Sjoberg, 2001	Perceived risk is closely linked to the spatial distribution of facilities. This finding is in line with the broader scholarly discussions on the nature of NIMBY.
	<i>Community characteristics</i>			The average education level, knowledge about waste management alternatives, and travel experiences in places where thermal treatment option are practiced were considered to be important community characteristics creating a background for consultations and decision-

Domain	Theme	Element	Reference/Source	Research Findings
	<i>Legal and institutional arrangements</i>	Pertinent legal and institutional structures, including overall waste management strategy	Rabe, 1992; Wolsink & Devilee, 2009	making. The institutional arrangement was highlighted as a contributing contextual element in the context of electing vs. appointing a Regional Chair.
	<i>Previous experience</i>	Experience of hosting and managing waste disposal facilities	Gallagher et al., 2008 ; Lawrence, 1996 ; Petts, 1994b	The findings suggest that the previous experience of hosting and managing waste disposal facilities influences public stances on a proposed project having thermal treatment plants. This connection was particularly obvious in the Niagara-Hamilton case study.
	<i>Experience of collaboration</i>			Previous experience of collaboration between the municipality/region and advocacy/community/environmental groups was considered to be an important contextual element, especially for building trust and avoiding conflicts (particularly about highly controversial issues).
	<i>Property value</i>	Perception about the changes in property value	Gallagher et al., 2008 ; Petts, 1994b	Property value considerations were not strongly voiced in relation to thermal treatment plants. Concerns over fluctuations of property values seem to be more salient to landfill.
	<i>Political involvement</i>	Participation of elected representatives	Lawrence, 1996	The <i>role of local politicians</i> and their position towards the proposed solution is considered to be the most important contextual element.
	<i>Policy priorities and directions</i>			Not only was the role of the local politicians considered to be an important contextual element, but

Domain	Theme	Element	Reference/Source	Research Findings
				also the <i>broader policy priorities</i> in terms of waste management sector.

5.6 Reflections upon the power dynamics in the analytical framework

In their article investigating the public participation processes in hazardous waste disputes through the lens of social power, Culley and Hughey (2008) present a three-dimensional view of power. The first dimension, Superior Bargaining Resources (SBR), implies the use of superior resources by one party. The second dimension, Control of Participation and Debate (CPD), is explained as the control of one party to set the agenda and to define “the rules of the game” in a way that systematically benefits one party. Consequently, participation by the less powerful is hindered. The third dimension, Shaping Interests (SI), is understood as “the ability of the relatively powerful (A) to control and disseminate myths and ideology which are used to shape the very thoughts, desires and interests of the relatively powerless (B)” (Culley & Hughey, 2008, p. 102).

The first dimension, SBR, was depicted in the case studies by having one party possessing more resources than others. Lidskog (1998) notes that participants often have unequal access to resources, such as money, competence, and time. Control over resources enables one party to dominate the discussion and bring forward its own perspective, rather than give all interests equal consideration. Wiedemann and Femers (1993) state that “a public participation setting might simply reproduce the inequality of power inherent in society” (p. 362). In the case studies, informants representing environmental organizations stressed that they experienced a lack of expertise to analyse technical reports as well as the funds necessary to hire lawyers and consultants. A balance in the first dimension of power can be improved by providing more support to those with fewer resources. As Wiedemann and Femers (1993) assert, such assistance will help to diminish the “knowledge gap” (p. 363) between experts and the general public. The latter does not imply merely providing access to information, but also technical expertise that could enable the public to produce competent and sound conclusions on the provided information. The intervenor funding initiative helps address the issue by providing more equal resources to different parties; however, since 1996 in Ontario this funding program is no longer available.

The second dimension, CPD, clearly relates to procedural issues in the planning process. The way public consultations are organized and run is decided by the organizer. The discussions can also be steered by those chairing the meetings. These factors give more power to those who are in charge of organizing public participation events. In the case of the Niagara-Hamilton thermal treatment project, an environmental activist noted that the public consultations were controlled by those in favour of the project by limiting the time for opponents to speak, ask questions, or raise certain issues. A similar criticism was voiced by a member of the public in the case study of the Niagara-Hamilton thermal treatment project who called the conducted workshops rushed as well as closed to public input or to

questions that were posed. In the case of the Durham-York project, on the other hand, an independent public facilitator, Mr. Robb Ogilvie (Ogilvie, Ogilvie & Company), was hired to moderate public discussions. Such moderation could be one way of bringing more balance to the second dimension of power - CBD. Aside from procedural steps and arrangements, power may be manifested through setting agendas and identifying questions in the first place. O'lear (2010) argues that much depends on who identifies the issues that need to be addressed by the decision-making process. Even if the public is able to influence the process, it will not be able to exercise its power to a full extent without access to the agenda-setting stage (O'lear, 2010). Therefore, giving a voice to the public and considering their comments should start at the early stages of the planning process, as is clearly identified in the proposed framework.

SI, which is the third and possibly most important dimension of power, focuses on who influences the thoughts and perceptions regarding the issues at stake. From the proposed analytical framework, three elements in particular relate to SI – public relations, information provision, and language. Public relations campaigns, including risk communication strategies, can influence the way the public perceives the risks associated with different technologies, issues at stake, and their possible solutions. In the case studies, these are the issues that related to the current state of municipal solid waste management, existing alternatives, and options, as well as the benefits and shortcomings of each. Some note that often “expert” and “scientific” knowledge are privileged over the public voices (Davies, 2001b; Weidemann & Femers, 1993; Karvonen & Brand, 2009). Moreover, “planners and the planning community as ‘experts’ are seen to be able to promote or restrict policies through their definition of what counts as knowledge and thus what views and values are legitimate” (Davies, 2001b, p. 208). The media, or the way media is used by different parties to bring across their points, can make a difference as well. During the case studies, the informants representing energy-from-waste industry claimed that the media, that mainly focused on older incinerators and their poor environmental performance, contributed towards creating a negative image of the industry. On the other hand, opponents of the Durham-York thermal treatment plant noted that the media coverage was unbalanced and the criticism expressed towards the proposed project did not enjoy due attention. Lastly, the language of communication proves to be one of the important elements not only in power-related discourse, but also in defining the notion of equity. Those who define the language in which information is provided, including the use of terminology, hold a significant lever to steer public perceptions and opinions. For example, in the case of the Niagara-Hamilton thermal treatment project, the representative of the environmental organization opposing the proposed development accused proponents of “sanitizing the language” in order to attract less negative attention. To this end, Lidskog

(1998) asks: whose meaning prevails in siting discourse, when various categories of groups, with different judgements on associated risk and possible consequences, are involved in the process?

The described three dimensions of power are useful in analysing power presence in the proposed framework. However, all three dimensions target mostly procedural issues. Procedural equity is seen as a way to address the imbalance of power in the public participation processes (Wiedemann & Femers, 1993). A question that remains is who has the power to make a final decision, or who decides the desired and fair outcome for a particular case? Within the context of the studied cases, the final decision on the proposed projects is made by local politicians who vote either for or against future development. The case of the Niagara-Hamilton thermal treatment project revealed the central role that the politicians played – after the change in the political establishment, the proposed project that previously enjoyed political support was terminated.

In more general terms, public participation is about the diffusion of power. In her famous article entitled “A ladder of citizen participation”, Arnstein (1969) refers to citizen participation as the redistribution of power. More specifically, Arnstein defines citizen participation as “a categorical term for citizen power” (1969, p. 216). Arnstein’s ladder of citizen participation presents the gradation of citizen participation into eight rungs (see Figure 14) clustered into the groups of “nonparticipation”, “degrees of tokenism”, and “degrees of citizen power”. The level of power distribution, or the power granted to public, increases as we go up the ladder. Despite the criticism addressed to Arnstein’s (1969) vision of citizen participation (see Tritter & McCallum, 2006; Collins & Ison, 2006) a ladder of citizen participation is relevant to this discussion as it focuses on power distribution especially during public participation processes.

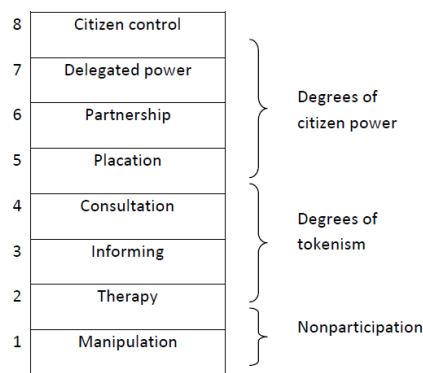


Figure 14 A ladder of citizen participation

Source: Arnstein, 1969, p. 217

In light of the present discussion, the difference between degree of tokenism and degree of citizen power is of particular interest. The stages that Arnstein (1969) labels as tokenism enable the public to participate, but do not necessarily result in change; thus, public participation remains “an empty ritual” (Arnstein, 1969, p. 216). In the higher stages of the ladder, the public is not only able to participate, but is also able to influence decisions and bring in change. In order to do so, the public should be empowered. Wiedemann and Femers (1993) explain that public empowerment requires “access to information, technical competence, compensation for time and effort, and the right to participate in decision-making” (p. 363). The SBR and CPD dimensions of power link directly with Wiedemann and Feme’s (1993) vision of public empowerment.

While studying community empowerment during the public participation processes, Rich et al. (1995) distinguish between formal empowerment and institutional empowerment. Formal empowerment refers to the existing mechanisms and procedures that give opportunity for the public to participate in the decision-making process, whereas institutional empowerment implies “the individual’s actual capacity for participating in and influencing a decision-making process” (Rich et al., 1995, p. 667). Instrumental empowerment is impossible without access to needed knowledge, competence, and material resources, or without access to the components forming the superior bargaining power. Formal empowerment, therefore, does not necessarily mean that instrumental empowerment is also present (Rich et al., 1995, p. 667). In the studied cases, the latter point was voiced by the informants representing public organisations or environmental groups. These informants noted that although formal possibilities for public participation were provided, adhering to the process did not enable them to influence the decisions. In addition to employing formal channels of participation, opponents of the proposed project employed their skills, competence, and connections to actively communicate their concerns and comments to the elective representatives.

The above discussion on power in relation to the public participation processes is not exhaustive. The broad nature of the notion of power, its importance to any decision-making process, and the work currently done to this end calls for a broader discussion on power in relation to equity considerations while planning controversial facilities. In particular, further research can be built on the scholarship in community psychology that explores how social power manifests itself during public participation processes of planning controversial infrastructure projects (see Culley & Hughey, 2008; Culley & Angelique, 2011).

5.7 Implications for planning theory

The outcomes of this research showed that equity considerations play a significant role during the planning process particularly for thermal treatment facilities. Moreover, it was revealed that equity depends both on process and outcome. One explanation of why equity has become an important part of the planning process may be sought in the work of Collin and Harris (1993) who state that since environmental planning is largely carried out at the grassroots level, people can participate; therefore, equity issues are taken seriously. According to Collin and Harris (1993), “equity in siting decisions is [thus] becoming a higher priority in land-use decisions and community development” (p. 105). This two-decade old statement is confirmed today: the equity dimension is an integral and important part of the planning process.

While proposing different types of planning approaches, Fainstein and Fainstein (1996) explained that *equity planning* focuses on the substance of programs rather than the process of decision-making. Similarly, Holden (1998) noted that equity planning is focused on “the more equitable distribution of goods in favor of those who have few resources” (p. 232).

The notion of equity should be discussed within the broader discourse on planning theory, in particular regarding planning approaches that call for enhanced public participation. Beginning in the 1960s, implications of public participation have been more strongly penetrating planning. In his article “Advocacy and Pluralism in Planning” (1965), Paul Davidoff elaborates on the model of advocacy planning. Advocacy planning approach is grounded on the belief that society consists of groups with different interests and values. Society is not an organic whole with shared ideas, but rather represents a pluralistic, heterogeneous organism where political power is unevenly distributed. Usually, interests of the powerful groups are taken into account in the decision-making process, whereas the voices of those without political power remain unheard. The advocacy planning model charges planners to act as advocates for those who are not empowered to protect their own interests and viewpoints.

Proposed by John Friedmann in 1973, transactive planning is another planning approach that focuses on participatory style. The main idea of transactive planning is to enhance interactions between a technical planner and his/her client. Friedmann (1973) claims that poor communication between a planner and a client is the main cause of “ambiguous and stereotyped attitudes that do little to resolve the basic problems” (p. 176). The transaction between planner and client is perceived as being verbal, personal communication in the form of dialogue which leads to mutual learning and generation of new

knowledge. Hudson (1979, p. 389) notes that transactive planning is concerned with interpersonal relations and the target community that has direct connection with the decision to be made. Transactive planning pictures an ideal world when “no group dominates others” (Sager, 1994, p. 157). Although conflict is considered to be a part of a dialogue, it is believed that conflict cannot override a dialogue but rather “conflict can be overcome by a mutual desire to continue in the life of dialogue” (Friedmann, 1973, p. 178).

The importance of communication between actors in the planning process is further enhanced in the communicative⁴² planning model. The communicative approach sees society as being a diverse and heterogeneous entity where people have different values and interests and see the world from their own perspective. In this diverse setting, the possibility of conflict may increase and the chances of reaching an agreement may diminish. Here the role of enhanced communication and collaboration emerges clearly (Healey, 1996). Enhanced communication helps to “build interrelations across our differences which will enable us to undertake strategic consensus-building work” (Healey, 1996, p. 217). As Healey (1996) states, our ideas, views, and even values can be formed through our communication and collaboration with others. This way, “respectful interpersonal and intercultural discussion” in the planning process is the primary focus of the communicative approach (Healey, 1996, p. 221). Forester (1989) considers communicative action to be essential for planning and explains that “without it there is no understanding, no common sense, no shared basis even for disagreement or conflict” (p. 143).

In the current theoretical discourse, equity planning is primarily concerned with the issues of distributional equity - that is, the location of the infrastructure project or potentially polluting facility. The definition of the *equity planning*, therefore, is focused on a more equal distribution of advantages and disadvantages (see Fainstein & Fainstein, 1996; Holden, 1998). Parallel to this, procedural elements of equity can be clearly detected in the above described planning approaches that try to strengthen participation practices. Fainstein and Fainstein (1996) label these planning approaches (except for the advocacy planning) as *democratic planning*. If we adopt a broader definition of equity that implies not only distributional aspect but also includes procedural equity, the definition of equity planning should be reconsidered. Rather than considering equity as a characteristic of a particular planning mode (e.g. advocacy planning), it should be recognized as a theme that cuts across various planning approaches, particularly those concerned with the public participation ingredient.

⁴² The terms “communicative planning” and “collaborative planning” are used interchangeably in the literature. This paper uses the term “communicative planning”.

5.8 Implications for the Environmental Assessment Process

The cases revealed stakeholders' dissatisfaction with the EA process which is often described as lengthy, costly, and unpredictable. As Dietz and Stern (2008) explain, the unpredictability of the EA process may to some extent result from the fact that public participation decreases an agency's autonomy and level of control: "Public participation takes time, requires an investment of resources, and often produces results that are messier than what might emerge from a purely internal agency process" (p. 54). Often EA processes are longer than the election cycle and given the politically-charged nature of the EA (at least in relation to waste management projects, as were noted in the conducted case studies), the change of the political establishment may alter the course of the project. This factor may add to the unpredictable nature of the current EA processes.

With the call to make EA more effective, less lengthy, and less costly, questions arise as to whether these changes may compromise broad stakeholder involvement and transparency of the process (Hanna, 2010; Usher, 2010). Inclusion of public participation in environmental assessment is a shift away from technocratic decision-making model when only scientists and experts gathered and analyzed information. Today it is widely recognized that nonscientific and local knowledge can complement expert judgment in environmental decision-making (Dietz & Stern, 2008). It is also noted that despite the possible changes, meeting diverse stakeholders' expectations about the improved EA process will be difficult (Garcia-Wright, 2010). A more nuanced look is essential to examine needed changes in the current Environmental Assessment procedure in Ontario to improve its effectiveness and efficiency while keeping the process open and transparent for all interested parties.

The other array of criticism is related to the concern that the Ministry of the Environment, particularly at the level of Ministerial review, enjoys a wide range of rights under the current EA regulations and can easily divert the project towards a chosen direction (see Lindgren & Dunn, 2010). As a result, the decisions over the EA undertaking become even more political and centred in one place rather than being a result of the multi-stakeholder process.

It was also noted that the introduction of the Waste Management Project Regulation was premature as the province has not yet developed the overall framework for waste management (Lindgren & Dunn, 2010). Consequently, project-level regulations were adopted before overall policy priorities and directions were identified and agreed upon. In this light, and given the recent discussions on the need to assess cumulative impacts rather than single project-level environmental impacts (Lindgren & Dunn, 2010), the concept of Strategic Environmental Assessment (SEA) gains importance. Over the last few decades that

project-based environmental assessment has been practiced, it has become apparent that EA has not given a possibility to assess broader paths for development (Kirchhoff, 2011). As Kirchhoff (2011) explains in his recent doctoral dissertation, “project assessments are usually reactionary, rushed, narrowly mandated and come too late in decision making to be generally effective vehicles for examining strategic concerns and options” (p. 27). Consequently, SEA enables addressing strategic concerns not reflected in the project-level environmental assessments.

The Strategic Environmental Assessment may help to evaluate a sectoral policy or a strategy on waste management for the province and identify its possible environmental, social, and possibly economic implications. SEA could give a possibility of addressing the issue of cumulative effects and integration of environmental considerations into sectoral policies, and examine broader (policy-level) objectives and alternatives (Bregha, 2009; Kirchhoff, 2011). The latter is particularly pertinent to the ongoing discussion on different waste management alternatives and the long-term synergetic effect of combining different waste management and disposal options, including thermal treatment of waste. In addition, the discussion on broader objectives resonates with the existence of fundamental opposition towards certain waste management options, as was revealed in this study. Involving stakeholders in strategic discussions over future developments in the waste management sector may facilitate creation of public trust and increase transparency of the decision-making process. This may help to reduce “the risk of deadlock during decision-making on individual projects” (Kirchhoff, 2011, p. 36). However, SEA is a lengthy resource-intensive process associated with significant expenditures (Smith, 2009). Its application, as well as the potential benefits that the study may bring, should be discussed and agreed upon by the main stakeholders.

5.9 Reflections upon certain points raised in the thesis

5.9.1 Coal-fired power plants vs. thermal treatment plants for municipal solid waste

This section presents some reflections upon coal-fired power plants and thermal treatment plants for municipal solid waste. The questions that arise are whether thermal treatment plants will share the fate of the coal-fired power plants in Ontario by being discouraged and eventually phased out. Since this is not the central question of this thesis, below are several points that can be considered while analysing this issue which may lead to more detailed discussion during further research.

Both coal-fired generation and incineration plants have been historically associated with air pollution and consequent negative health implications. Because of the heavy reliance on the coal burning in the 19th and 20th centuries, some large cities suffered regularly from smog. For example, the culmination of heavy air pollution caused by coal combustion and extreme cold was the “Great Smog” that lasted from December 5 to December 9, 1952 in London, UK (Wallace & Hobbs, 2006). In this regard, both coal-fired generation and incineration plants share similar historical connotations.

However, there are different alternatives existing for each of these cases. Coal-fired generation has different alternatives such as natural gas, renewable energy sources, and nuclear power. By looking at electricity generation in Ontario, it is clear that the sources of power are quite diversified with a decreasing reliance on the coal-fired generation. A phase out target has been established by 2014, and is a main contributor in decreasing coal-fired generation (See Figures 15 and 16) (Ontario Ministry of Energy, 2009).

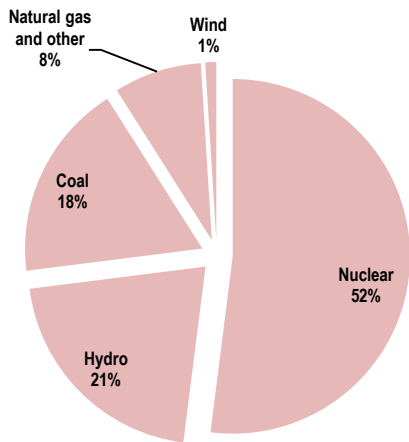


Figure 15 2007 Ontario Energy Mix

Source: Ontario Ministry of Energy, 2011

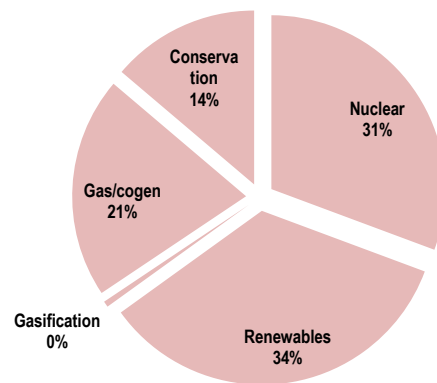


Figure 16 Target Capacity Mix in 2025

Source: Ontario Ministry of Energy, 2011

In terms of incineration, one may argue that the alternatives are neither diverse nor well-established. Waste recycling and composting rates are on average between 30 and 40 percent, which leaves most of the waste stream for disposal. As for landfills, some municipalities have landfill capacity for the coming years, but eventually face the need to site new landfills or explore other disposal options such as thermal treatment. Both of the latter alternatives are viewed negatively by wider public and environmental groups.

Whereas the province has taken concrete steps to phase out coal-fired generation, the provincial policy in relation to thermal treatment plants is not so straightforward. Few municipalities have explored the thermal treatment option and Durham and York Regions are now in the “Project Phase” which involves the design, construction, and operation of a facility (Durham York Energy Centre, 2013). It is difficult to predict whether thermal treatment in general and incineration in particular will share the fate of the coal-fired generation in Ontario. It is clear that in both cases there is strong opposition among the public and community groups as well as among politicians. Meanwhile, similar to advanced thermal treatment technologies that aim to have better environmental performance compared to the conventional incineration plants, “clean coal” technologies are being developed to improve the energy efficiency of coal and reduce GHG emissions⁴³.

The emphasis on generating energy from renewable energy sources (wind, solar, hydro, biomass, and biogas) is outlined in the Ontario Green Energy Act that was enforced in 2009. In order to encourage the creation of strong green energy sector in the province, the Green Energy Act established a one stop streamlined approval process for renewable energy projects (Ontario Ministry of Energy, 2010). Since municipal solid waste is not considered a renewable energy source, the energy generated through thermal treatment plants is not labelled as “green”. However, the organic fraction of municipal solid waste may be used as a renewable energy source - biomass through anaerobic digestion. Interestingly, some recent cases confirm that even in renewable energy projects, the public has expressed strong opposition (e.g. against wind power)(see Smith & Klick, 2007).

5.9.2 Public body as a proponent vs. private company as a proponent

The second important point that emerged during this research is related to the proponent. All case studies present the situation where the proponent is a public body – a region or municipality. The application of the proposed framework to the cases when the proponent is a private body can be

⁴³Canada has expressed its intent to contribute towards developing clean coal technologies. For more details see “Canada’s Clean Coal Technology Roadmap” available at http://canmetenergy-canmetenergie.nrcan-ncan.gc.ca/eng/clean_fossils_fuels/clean_coal/roadmap.html

particularly interesting given that certain aspects of the proposed analytical framework may be altered or at least viewed in a new light. One such issue may be related to the criticism revealed during this research about a pre-determined outcome of the project. It will be interesting to explore whether a similar criticism will emerge where there is a private proponent and how the neutrality, trust, and unbiased decision-making will be evaluated by the parties. Other issues of interest can be those related to the role of politicians or the presence/absence of political support for the private company.

Research revealed that previous experience of working with the public and various community groups may prove to be beneficial while dealing with controversial projects. The following question arises: if a public body such as a municipality has such experience built up over time, how can a private company that may be not so experienced with a particular community mitigate this limitation and how can the company's staff be prepared to deal with the expected controversy and the need for intense public consultation process?

Possibly one of the most important points that differentiates the planning processes run by public and private proponents is the question of who bears the costs. When the proponent is a public body, the costs for planning are covered by the municipality or region. In other words, the money for lengthy planning and consultation processes comes from taxpayers. However, if a proponent is a private company, the planning costs, including public consultation costs, are the private company's responsibility.

Chapter 6

Conclusions

This chapter discusses the main outcomes of this research. Section 6.1 explains the contributions made to the existing knowledge and offers recommendations to policy-makers and planners regarding effective incorporation of the equity dimension into the planning process of waste disposal facilities. Section 6.2 provides suggestions for further research.

This research explored the planning processes surrounding the development of thermal treatment plants for MSW in Ontario by focusing on the equity dimension. The research aimed to reveal the role and the nature of substantive equity, procedural equity, and cost and time efficiency, as well as the role of contextual elements in planning processes for thermal treatment facilities for MSW in the province of Ontario, Canada, and to provide recommendations on the effective incorporation of the equity dimension into the waste management planning processes.

Through a review of the literature on planning controversial facilities with a focus on waste disposal plants, the existing knowledge gaps were identified. It was revealed that the clear delineation of substantive and procedural equity as well as the identification of the primary elements that fall under these notions are absent. Different studies present various elements of the substantive and procedural equity, but they fall short in consolidation and analysis of linkages among the elements. In addition, it was revealed that the study of the contextual elements in relation to substantive and procedural equity has been quite limited.

Three research questions were identified that were informed by two assumptions derived from the consulted literature. To answer the research questions, three cases of planning thermal treatment plants in Ontario were investigated. The first case studied Halton region thermal treatment project that was initiated in 2006, but was soon dropped without reaching the stage of the full environmental assessment. The second case study focused on Niagara-Hamilton thermal treatment project that was a joint effort between the city of Hamilton and the regional municipality of Niagara to find a local solution to the waste problem. An environmental assessment was conducted; however, before its completion the parties decided to stop the project and instead concentrate on other waste management alternatives. Finally, the third case studied Durham-York thermal treatment project that underwent full environmental assessment process and is currently close to its completion.

The first and the second research questions were answered by consolidating the various elements of substantive and procedural equity and the context into a comprehensive *analytical framework*. The developed analytical framework consists of the following domains: efficiency, substantive equity, procedural equity, and context, and presents themes and elements that fall under these domains (see Table 6). The study identified not only the elements belonging to these domains, but also the connections among them (See Figure 13). The study of the connections existing among various elements showed the dynamics that would not be visible by studying any single domain or by solely concentrating on the elements. The findings of the study explained how elements falling under each domain are linked to each other and identified the cross-domain linkages influencing the equity dimension of the planning processes. *The third research question* was answered by providing more concrete recommendations to policy-makers and planners (see Section 6.1.2).

6.1 Core research contributions

6.1.1 Contributions to the existing knowledge

This research contributes towards expanding the conceptual discourse about the role of equity in planning waste disposal facilities with a particular emphasis on thermal treatment plants. More specifically, the thesis contributes towards delineating the notions of substantive and procedural equity and distinguishing their elements. The notion of context is introduced and contextual elements are explored that influence substantive and procedural equity during planning processes for thermal treatment facilities. As a result, the thesis develops a comprehensive analytical framework that consolidates the major elements falling under the domains of substantive equity, procedural equity, and context that have previously been dispersed in the literature. In addition, the research establishes linkages among the elements within each domain and across domains. Based on the findings of the case studies, the notion of distributional equity is reconsidered. Whereas the distributional aspect of the equity dimension is undoubtedly important, the thesis concludes that the substantive equity should go beyond the locational aspect of planning (see Table 6). The existence of cross-domain linkages and their importance and diversity confirms that the notion of equity should be studied and discussed in broader terms which not only acknowledge procedural or distributional issues, but also contextual elements and efficiency questions. The existing scholarship places particular emphasis on locational considerations (siting) and procedural issues; however, it fails to present a comprehensive and multidimensional view of

equity and explain how it is embedded within the broader context. This research attempts to present equity with all of its diversity and complexity and build a ground upon which further work in this direction can be conducted.

More broadly, this research contributes to the better understanding of the perceptions and motivations behind public opposition towards infrastructure projects, and particularly waste management facilities. Given the complex nature of public opposition phenomenon, the research addresses the need to build an in-depth understanding of public motivations and perceptions that shape their attitude towards proposed projects (Schively, 2007).

By focusing on the role of the equity dimension in planning thermal treatment facilities, the thesis explores the deep controversies around this waste management option. Therefore, the current research also contributes to the on-going discussion about the advantages and shortcomings of thermal treatment as one possible waste management alternative within the larger integrated waste management system.

The thesis investigates three recent cases of planning thermal treatment plants in Ontario, and based on the official documents and interviews, reconstructs a chronological order of the planning process. These detailed descriptions of the case studies can be useful for those interested in the recent history of waste management planning in Ontario. In addition, the rich descriptions of the case studies may be of interest to waste management professionals and planners in order to make their own conclusions on how to improve their work and address some shortcomings that others have experienced.

On a methodological front, the thesis applies a critical realism paradigm to investigate the public opposition phenomenon. The contribution here is twofold – firstly, from an ontological perspective the public opposition is acknowledged as a complex phenomenon; and secondly, the critical realism research paradigm is applied to the planning discipline. Although public opposition towards unwanted land uses has been researched from various perspectives, the existing scholarly work fails to apply complexity lenses towards this social phenomenon. Using critical realism as a methodological approach provides a new perspective on public opposition as a complex social phenomenon; this array of work needs to be broadened in further research. In addition, despite its potential for bringing new insight, critical realism is rarely used in the planning discipline. The most salient discussion on implications of critical realism for urban and regional planning and how critical realism as a philosophy of science can be applied in planning research is offered by Banai (1995). However, Banai's (1995) attempt to explore this field did not receive further attention by planning scholars. More recently, De Roo et al. (2012) and Palermo and

Ponzini (2010) made connections between critical realism and planning theory discourse, and in their study of travel behaviour, Naess and Jensen (2002) applied critical realism approach. However, these attempts are by no means exhaustive. Critical realism is more actively applied in educational research (see Ayers, 2011; Priestley, 2011; Scott, 2010); human geography discipline (see Yeung, 1997; Pratt, 1995); and organization and management studies (see Fleetwood & Ackroyd, 2004; Blundel, 2007; Piekkari & Welch, 2011). This research is possibly the most thorough attempt to introduce critical realism methodological paradigm into planning research. However, this may be only the beginning and more can be accomplished in this direction.

More practical contributions of this thesis are presented below in the form of recommendations for policy-makers and planners.

6.1.2 Recommendations for policy-makers and planners

The following recommendations are developed based on the conducted case studies and aim to assist policy-makers and planners in incorporating equity dimension in the planning process of waste treatment and disposal facilities and particularly thermal treatment plants.

1. Given the controversial nature of the issue, due attention should be paid to the involvement of the public in the early stages of the planning process. In order to do so, pursuing public education/information campaigns from the very start of the project can be considered as well as the broader adoption of internet-based tools (such as interactive web-sites and social networking).
2. In order to gain an understanding about the position of the wider public about the proposed project, surveys, referendums, or internet polling can be considered. By introducing these options the planners can foster participation of “non-organized” public or local constituents who are not part of an organized interest group or organization (Davies, 2001b). More broadly, developing more interactive web-sites and using social networking sites more actively (e.g. Facebook, Twitter) or other internet-based tools could make it more convenient for people to express their opinions or ask questions and thus become involved in the process.

3. In order to build trust and create the ground for further collaboration, ties with the community and advocacy groups should be created through regular cooperation. Such a starting position could help to avoid tensions during the planning process and could result in more acceptable outcome for the parties.
4. Training the regional staff on how to deal with the controversial issues could be considered. As a result, staff will be prepared for an intense and often lengthy process of project planning and public consultation. Training may prove to be especially beneficial when the similar experience of planning waste disposal or treatment facilities in a given region or municipality is absent.
5. The need for re-introducing intervenor funding should be further explored. A more detailed discussion should be held about the advantages and disadvantages of intervenor funding. The case studies revealed that this issue remains quite controversial and the parties have different opinions about the effectiveness and need for having intervenor funding⁴⁴.
6. Agreeing upon the common language and the most critical terms may contribute towards strengthening the procedural equity element of the planning process. Particularly, the use of terms “thermal treatment”, “energy-from-waste”, and “incineration” may require clarification and agreement during the early stages of the planning process.
7. When it comes to the environmental performance of waste disposal facilities and particularly thermal treatment plants, the conflicting conclusions of studies further confuse the public and hinder reaching consensus. Creating the database of case studies from various countries on different thermal treatment technologies could contribute towards solving this issue.

⁴⁴Intervenor funding assists the public to study technical and legal aspects of the proposed undertaking. Similar funding was provided to the interested public based on the Intervenor Funding Project Act that expired in 1996. Therefore, since 1996 no funding has been provided to the public. The study conducted by Levy in 2002 to investigate the present state of the environmental assessment process in Ontario concluded that one of the reasons for reduced public participation was the absence of the participants’ funding.

On the other hand, the call to provide funding to the public may be seen as an indicator of the lack of trust in the government’s capacity to objectively and accurately assess all pros and cons of the proposed project. The linkage between the perceptions of procedural justice and perceived legitimacy of authorities is asserted by Besley and McComas (2005).

Although the studies may offer different conclusions, they will be accessible to all parties. As a result, participants of the planning process will be able to better understand the judgement of their opponents.

Public participation processes are not without difficulties, controversies, or even conflicts. However, the main purpose of a participatory planning process is to create an environment where communication, exchange of ideas and knowledge, and dialogue are possible. As Lidskog (1997) notes, the existence of a dialogue is no guarantee that the consensus will be reached; however, it provides an arena where “different perspectives and understandings can confront and vie with one another constructively and democratically” (p. 240). The prerequisite for having a dialogue is the recognition that none of the stakeholders possess complete knowledge and their views or experiences are not superior to those that the others possess. The actors need to realize that “it is through communication that knowledge is created, and in this communication social rationality and scientific rationality have to meet each other” (Lidskog, 1997, p. 246). The criticism by the members of the public that was revealed during case study research often relates to the fact that the decision may have been made before public discussions were launched. Some noted that their impression was that the decision was forced upon them and not that the proponent was seeking a dialogue and mutual exchange of perspectives. Planners, therefore, need to create conditions that encourage and nurture wider participation, dialogue, and constructive exchange of ideas.

6.2 Suggestions for further research

The research revealed the importance of community context and various elements that can influence the procedural equity domain. More research needs to be conducted to this end. Particularly, future work can draw from the existing scholarship on the interrelations between social capital and tradition of collaboration. As the notion of social capital is a broad concept, different aspects can be studied in relation to past and present collaboration efforts, such as networks of civil engagement or the role of human agency. Given the importance that the literature assigns to the existence of trust, a more nuanced look is needed to explore the relations between trust-building and tradition of collaboration in the communities. In general, future research on community context and its role in strengthening equity considerations can bring together and further investigate the contextual elements identified in this research – community characteristics, collaboration experience, and capacity of community/advocacy

groups, as well as the connections among these elements and with those located under procedural equity domain.

This research showed that the notion of equity transcends the disciplinary discourse and encompasses a broad spectrum of issues and concepts. The investigation of the linkages existing across various domains revealed that the elements that influence equity considerations are embedded in different disciplines. For example, the importance and role of local knowledge is extensively explored in anthropology (see Geertz, 1983); human agency and its interaction with broader institutions - in sociology (see Giddens, 1979), the role of social capital - in political science (see Putnam et al., 1993); and in sociology (see Coleman, 1988; Portes, 1998). Broadening the disciplinary study of equity may shed new light on the dynamics existing across different domains and help further refine the identified elements.

The conclusions of this thesis adopt a broader definition of equity that includes not only a distributional aspect, but also procedural issues. The current theoretical discussions in planning theory consider equity planning to be concerned with the distributional questions. Although the procedural aspects of equity are present in participatory planning approaches, the discussion of these conceptual linkages is limited. This calls for more comprehensive analysis of connections between the notion of equity and planning theory.

It will be useful to followup this research through application of the developed analytical framework to other cases of planning thermal treatment plants not only in Canada, but also in the international context. In addition, the framework can be used to analyse the planning processes of various types of waste management facilities, such as landfills, transfer stations, and anaerobic digestion plants; or for facilities dedicated to different types of wastes such as hazardous and nuclear waste. In this research it was impossible to test the developed analytical framework on international cases or other types of waste disposal and treatment facilities; however, wider applications in future research will help to further refine the framework.

Studying efficiency domain in more details could contribute towards better understanding how this domain is linked to other three domains. In particular, efficiency can be divided into more specific elements such as human resources, financial resources, and administrative resources. Human resources may include volunteers, who are willing to be actively involved in the planning process.

A more thorough exploration of the role that thermal treatment can play within the integrated waste management system in Ontario is needed. Such analysis should be based on the present circumstances

and future projections of waste amounts and composition, as well as demographic alterations, changes in production processes, and consumption patterns. Creating a conceptual piece with a thorough analysis of thermal treatment as a component of the IWM system in Ontario can assist policy-makers in developing long-term visions of the waste management system in the province.

Procedures for ensuring just decision-making are the core of the 1998 Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters (Aarhus Convention) (Davies, 2006). This international environmental agreement sets specific legal obligations for the member states that aim to strengthen the three pillars of environmental governance - access to information, public participation, and access to justice (Francis-Nishima, 2003). The discussion on equity considerations and their incorporation in the planning process directly links to the regulations set by the Aarhus Convention. As Canada is not a member of the Aarhus Convention, it would be beneficial to investigate whether joining the Convention could strengthen the equity dimension of the planning processes, and if yes, in what way.

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Appendix A

The interview guide

PROCEDURAL EQUITY:

- **Representation** (broad involvement)
 - What procedures/measures have been used to ensure representation in the planning process (e.g. early and extensive public involvement, notification of citizens and involvement of the local community)?
 - What obstacles would you distinguish that hinder achievement of representation?

- **Voice**
 - What was the format and frequency of public consultations held during the planning process? (What documents could I consult for more details? Are they available online?)
 - Who were the major participants of the public consultations (active participants)?
 - Did the consultation process help in generating and procuring advice from the public?
 - Did the consultations serve to involve the public in decision-making process?

- **Consideration**
 - To what extent have the concerns and issues raised during public consultation been incorporated into the decisions? Could you provide examples?
 - Has the public been notified whether their concerns have been accepted or rejected in the final decision?

- **Environmental mediation**
 - Did any major conflict take place during the planning process? If yes, what was the reason for the conflict? Could you provide examples?
 - (*question in case of the failed planning process*) What role did the conflict play in the negative outcome of the planning process?
 - In case of conflict, what steps can prove to be effective for its resolution and consensus-building (e.g. establishing agreement between a proponent and the interested community parties)? (if this was the case, could you please give a detailed description)
 - What are the measures that could prevent possible conflict (e.g. dialogue with the public, transparency of decision-making and decision-execution, including financial transparency; respectful treatment and level of trust in decision-making authority). If you undertook such measures, please provide examples.

- **Public Relations**
 - What was the nature of public relations (PR) campaign pertinent to this project? What issues or aspects of the project were stressed most during the PR campaign?
 - How was the possible risk of the planning facility communicated with the public (any purposeful exchange of information about health or environmental risks between

interested parties)? Do you think that the risk communication strategy was successful? What changes would you make?

SUBSTANTIVE EQUITY:

- **Desired outcome**
 - What is your perception of a fair outcome of the planning process?
 - How is the spatial distribution of facilities connected with the perception of a fair or desired outcome of the planning process?

- **Compensation**
 - What kind of compensation scheme has been applied for (*name of the case*)?
 - What has been your experience in regard to the effectiveness of compensation scheme applied for (*name of the case*)?
 - What role does the compensation scheme play in formulating desired outcome?
 - Given your experience, what would be your comments on financial vs. in-kind or public good compensation?

- Would you agree that substantive and procedural equity influence public acceptance of thermal treatment facilities?

- What is the connection between procedural and substantive equity?

EFFICIENCY:

- **Efficiency**
 - Could you comment on resources spent for the implementation of the planning stage of this project (e.g. financial expenses, time required, personnel and other agency resources)
 - Do you think that the costs of the planning process were adequate to the final outcome in terms of its acceptance by different parties? (Do you think that this was the optimum level of trade-off made between the costs and achievement of the fair planning process and outcome? How would you measure the optimum level?)

- Would you agree that it is necessary to make trade-offs between achieving a high degree of substantive and procedural equity, and cost and time efficiency?

- Given the above discussion, how can the equity dimension be effectively incorporated in the planning process?

CONTEXT:

- What are the contextual elements that influence the achievement of substantive and procedural equity in the planning process? (Among those elements, which are the main ones?)

- **Perceived Risk**
 - Please describe the perceived risk associated with the environmental and health impact of this thermal treatment plant, as well as an uncertainty about the safety.
 - What elements influenced the formulation of the perceived risk?
 - What role did the perceived risk play in formulating public stances during this planning process?

- **Legal and Institutional arrangements**
 - What was the role of the pertinent legal and institutional structures in achieving procedural and substantive equity (in conducting fair process and achieving desired outcome)?
 - Are there any legislative or institutional aspects that served as obstacles in this process?

- **Previous Experience**
 - What role did the experience of hosting waste disposal facilities play in formulating public acceptance of this thermal treatment facility?

- **Property value**
 - What role did the perception about the changes in property values play in formulating public acceptance of this thermal treatment facility?

- **Political involvement**
 - Could you describe the involvement of the elected representatives in the given planning process? What would be your comments about their participation, the role they played in the process?

Appendix B

Communications Tactics Developed for EA Terms of Reference, Niagara-Hamilton Joint Study on Waste Disposal

Internal Communications

	Tactic	Details	Timing	Estimated Cost
Required	Training for Front Line Staff	Training for staff from both municipalities who answer general telephone inquiries, so that they can provide basic information and appropriately direct calls	ASAP and ongoing as information becomes available	N/A
	Study Updates	Study updates written regularly for Councils, Media, and Neighbour Municipalities	ASAP and ongoing as study progresses	\$8,000
	Email/Intranet posting	Email and post media releases, etc. for municipal employees	ASAP and ongoing as study progresses	\$0
Optional	Political Information Sessions	Sessions to keep members of Council up-to-date on the study as it progresses	As needed	Consultant fee
	Councillor Newsletters	"Cut & Paste" info made available to Councillors for inclusion in Councillor newsletters	ASAP and ongoing	\$0

External Communications

	Tactic	Details	Timing	Estimated Cost
Required	Design of Communication Materials	Items such as Logo, Advertisements, Brochure, Letterhead, and PowerPoint Slides	December/January	\$12,000
	Integration of Study Information into Current Activities	Staff will have information available about the study at community events planned for other program purposes	Ongoing	\$0
	Discussion with Advisory Committees	Facilitated input from established Council-approved Waste Management Advisory Committee and Waste Reduction Task Force	Ongoing	\$0
	Internet	Develop stand alone web-site for the process, to post information. Proposed domain name: www.wasteplan.ca	December	\$11,000
	Letters to Community Groups, Interest Groups, and Interested Individuals	"What does this mean for me?" information to encourage participation in the study and establish and maintain contact lists	Ongoing and as requested	\$2,500
	Information to	Keep other municipalities involved	Ongoing	\$0

	Neighbouring Municipalities	in the process through regular electronic updates.		
	Newspaper Advertising	Ads to promote public sessions and process in both municipalities.	Dec 2003 – April 2004	\$60,000 (total for all ads)
	Local Cable TV	Promote study, open houses, and workshops on local cable stations that offer free Public Service Announcements	Dec 2003 – April 2004	\$0
	Public Open Houses	Two sessions planned in each municipality for the development of the EA Terms of Reference	Dec 2003 – March 2004	\$20,000
	Public Workshops	Three sessions planned in each municipality for development of the EA Terms of Reference	Dec 2003 – March 2004	\$45,000
Optional	Mass Mail Piece	Direct Mail piece is one of the most effective ways to reach the public. Use of existing mail outs will be pursued	If necessary	\$65,000
	Ward/Municipal Meetings	Presentations at Ward Meetings, Council Meetings	As requested	N/A
	Focus Groups	Smaller sessions can be used to explore barriers to implementing an EFW facility and gather information to develop telephone and mail surveys	If and When Required	\$40,000
	Public Opinion Poll	Telephone survey of residents to get input on the development of the EA Terms of Reference	If and When Required	\$50,000
	Mail out Survey	Mail in survey to get resident input on the development of the EA Terms of Reference	If and When Required	
	Video Presentation	Presentation discussing Disposal Options – to be used when Consultant is not available, online, local cable stations, etc.	TBD	\$400-\$1,500

Media Communications

	Tactic	Details	Timing	Estimated Cost
Required	Media Releases	Regular updates as the project develops.	Ongoing	\$0
	Media Advisories	Invitations to media to attend specific events	Dec 2003 – March 2004	\$0
Optional	Media Editorial Boards	Political representatives from the Joint Working Group to be spokespeople along with staff during "Media Tour" at key points along the schedule	As Required	\$0
	Media Kit	Package to be put together to hand out to media	February	\$10,000
	Local Radio and Television Call-in Shows	Study-related issues pitched to local radio/tv personalities in order to drum up awareness of the study, open houses, and workshops with the public		\$0

From: MacViro Consultants et al., 2004b, p. 10-11

Appendix C

Excerpt from the facilitated workshop held on April 14, 2007, Durham-York Residual Waste Study

Q: That needs to be done. I have more. I went to the meeting the other night hoping to hear something encouraging and I left with many concerns. Here is why and here are the facts. I learned for every tonne that Durham produces, York Region produces 2 tonnes of waste, $1 + 2 = 3$. Should an incinerator come to Clarington, we will be tripling the waste to process. One tonne that we have of ours to process, now becomes 3 tonnes. Triple, that's a factor of 3. That is a terrible problem for Durham Region. That is an outrage for Clarington. Not only that, but I also learned at the meeting the other night that 20% by mass if there was incineration still has to go to landfill. I'm a math teacher and I did a calculation. So now we are up to 3 tonnes. For every 1 tonne of ours and 2 tonnes from York Region, we are up to 3 tonnes. 20% of 3 tonnes is .6 of a tonne that would need to be landfilled. I understand that a lot of that would be ash but still 2 to 3% highly toxic stuff. Let's look back at where we were. We were at 1 tonne from our Region. Now we have emissions for processing 3 tonnes and we still have .6 of a tonne for landfill. This is a disaster. This is not right. York Region should be responsible for York Region's garbage. We should be responsible for our garbage. It even flies in the face of common sense to think that all of these garbage trucks are going to be coming down the highway. We are supposed to be environmentalists. We are telling people to drive as little as possible. We have beautiful Lake Ontario down here. Toronto is trying to reclaim their waterfront and we are going to put up another smoke stack? This is not good. This is terrible. This is a terrible example. Let's make it local and let's make us responsible. I have heard that the cost is prohibitive to a Region this small, yet I've heard that it's possible to make these thermal treatments on a smaller scale. That is the way we may need to go. Instead of concentrating on one area, concentrating the pollutants for the residents of that area. This is a highly populated area with a lake beside it and we drink from that lake water. After attending two of these public information sessions, I am still very troubled. I am more troubled now today than I was last time. What is the recourse for us? Is Durham Region Council going to give us a special public meeting? Is our local Council going to give us a special public meeting?

R [Robbi Ogilvie, the Independent Public Facilitator]: I would like to allow David a chance to respond to your initial question.

D [David Merriman, Former Consultant with GENIVAR]: As we said at the previous meeting, York Region has a project that may take 100,000 tonnes of waste to another facility. So the numbers may be reversed. Durham may have twice as much as York. The people in York Region are asking similar questions, if that was the case. This is a partnership between Durham and York and that was the understanding that was started, so the issue of where the site is in relation to whose waste, wasn't one of the factors that we ever took into consideration. With respect to your concerns about the emissions and health effects, a comprehensive human health and ecological health assessment is currently underway. That will likely be the subject of the next round of consultations, when we have those numbers and answers to those question and others that you have raised.

Q: The first part of his answer was not clear to me, I didn't understand it. York Region has a project to what?

D: In York Region, there's a project with Dongara, a private sector developer. York has about 250,000 tonnes right now, say 150,000 tonnes when they get it to recycling to get these quantities down. So you have 100,000 tonnes from Durham and 150,000 from York. York Region has a program, this Dongara project, to take 100,000 tonnes of York's waste. In which case, it would be 100,000 tonnes of Durham and 50,000 tonnes of York. So your numbers would be reversed. Also when we are talking about space, yes ash is heavier but it takes up less space. So in terms of landfill capacity, it's only 10% of what went in, not 20%, because landfill capacity gets used up by space not how much it weighs.

Q: But it is 20% by mass?

D: By weight, yes.

Q: I'm still not clear, how decided is that about York Region? Your boards say 100,00 tonnes from Durham Region and 200,000 tonnes from York Region. So now you are telling me different numbers.

D: The final decision on the York project has not been made. It will likely be made within the next couple of months.

R: Ok but is there a discrepancy in the numbers between the boards and what you just said?

D: When we started the planning exercise, we planned on a minimum of 250,000 tonnes to a maximum of 400,000 tonnes. That was our broad planning range that we set back in 2005 when we were doing the terms of reference and it's the framework in which we are doing the approvals. We are now getting into Municipal specific agreements to get commitments because we are not going to build this facility without understanding very clearly and precisely, whose waste and how much of it. So those final estimates firming up those

quantities are now underway. So in a planning sense 250,000 tonnes minimum and 400,000 tonnes maximum, the 400,000 came from the population growth. If we forecast the populations of Durham and York out 25 years, we get these higher numbers. So it is not a discrepancy. We've been planning, that's the planning framework. We are now tightening up the actual agreements as to who comes to the facility. Before this facility breaks ground or before they spend money with a vendor, we will have a tight agreement as to precisely whose waste we will bring.

R: Thank you David, I need to move on and you can come back. Let me go upstairs Peter.

Q from the audience: She didn't get all of her answers, she didn't get all of her questions answered. She asked about public meetings.

R: Sorry, what I asked her to do was to come back a second time because I needed to move on. The amount of time that she is consuming is getting way over so I said to her as she went, come on back for a second round when I assume she's going to ask her supplementary question. So if you would permit me, we are going to make sure it gets answered and I hate asking this but trust me. Now call me on it if you are not satisfied, thank you for letting me proceed.

Source: Ogilvie, Ogilvie & Company. (2007b). Durham/York Residual Waste Study. Summary. Public Information Session. Municipality of Clarington. Municipal Offices, Bowmanville. April 14, 2007. P. 30-32. Available online: <http://www.durhamyorkwaste.ca/pdfs/study/appendices/Facilitator-Summary-Report-Ididnt-Get-a-Chance-to-Say-April-14-07.pdf>