Throwing Out the Trash: Waste to Energy In New York City
An Analysis of Environmental Justice and NIMBY Concerns

Abstract: New York City faces a crisis in its waste management system. Relying on expensive garbage export since the closure of Freshkills in 2001, the Department of Sanitation released a report in March 2012 documenting alternatives using biogas, as well as potential sites. What they did not include was any discussion of the complicated mix of potential Environmental Justice issues, NIMBY backlash of area residents and the decisions of businesses when the project moves through the approvals process. This paper explores concerns of the sites' stakeholders and attempts to determine if they are rooted more in self-centered NIMBYism or a reaction over the over-reliance of siting facilities in poor communities that led to Environmental Justice. It also seeks to find a compromise that will avoid years of legal battles to force a project on a community.

LUKE McGEEHAN

MASTERS OF SCIENCE IN URBAN PLANNING

GRADUATE SCHOOL OF ARCHITECTURE, PLANNING AND PRESERVATION

COLUMBIA UNIVERSITY

May, 2013

ADVISOR: SMITA SRINIVAS
READER: GRAHAM TRELSTAD

Introduction

New York City's municipal waste system is in danger. A decade after Fresh Kills Landfill was closed to garbage, export systems are becoming a financial drain on the city's budget. At nearly $100 per ton, shipping garbage to Pennsylvania, Virginia, Ohio and South Carolina is both fiscally and environmentally unsustainable. The total cost of tipping fees in fiscal year 2012 was $360 million. The trash has to go somewhere, but local efforts have made it clear that locally processing or storing waste is not a favored option. It is no surprise then that the city's Department of Sanitation (DSNY) is actively seeking alternatives. One of the more promising alternatives to thermal technologies (which have their own merits) is anaerobic digestion which produces biogas, rich in methane. The gas can be processed and used similar to natural gas, for heating and energy purposes. The DSNY report released in March recommended the construction of a biogas facility to treat residential municipal solid waste closer to home. It was followed by a request for proposals (RFP) from Mayor Bloomberg's office for a private waste facility to process at least 450 tons of garbage per day. This RFP specifically excluded thermal processes, and suggested "gasifier, pyrolysis, anaerobic digester, etc" technologies.

The DSNY report, assuming that the agency would be responsible or in partnership on the facility, proposed nine sites in the city that could fit selected technical criteria for size, zoning and access, among others. The consultants who filed the report, Alternative Resources, Inc. (ARI), were asked to address Environmental Justice concerns, to which they merely wrote:

> "There were some discussion (sic) pertaining to Environmental Justice issues, but it is recommended that future evaluation of the more favorable sites include more detailed consideration of community concerns."

Given the increasing attention that DSNY and other city and state agencies have paid to Environmental Justice in recent years, it is startling how the consultants seemingly brushed off the issue and DSNY failed to push them to look more closely at it. In fact, given that DSNY put so much time and effort into their "Fair Share" policy, where the agency committed to equitably splitting the burden of waste collection and export among the five boroughs in a nod to Environmental Justice, it is surprising that a report was published without acknowledging these principles.

Picking up where they left off, this paper attempts to address the Environmental Justice and community concerns that will present tremendous challenges to any biogas project seeking approval. Not only that, but Not In My BackYard (NIMBY) based objections from stakeholders who dislike the idea of living or working near a waste facility are likely to be a problem. NIMBYism has become a major problem in site planning, and pushback from communities often results in projects failing to get critical approvals. Environmental Justice advocates, who advocate against siting unwanted facilities in minority or low-income neighborhoods, tend to be generally against waste to energy proposals on principal. On the other hand, there are stakeholders who may have a vested interest in the success of the project, particularly from the business community who may stand to earn additional income, helping to form support for the facility. Seeking to address New York

City's waste crisis in a sustainable and clear manner, it will be important to keep all these considerations in mind.

An even more challenging problem is to understand the stakeholders' opinions and justifications in order to work toward a compromise. All too often, projects end up in drawn out legal battles, adding to mounting costs. Municipal projects are no different, with waste planning often subject to NIMBY oriented complaints and diffuse support, even renewable energy and other 'green' projects are getting caught up in neighborhood battles. So, what are the stakeholder reactions to proposed biogas sites and their underlying causes, and in what ways can the city work with them to avoid deadlock on important projects?

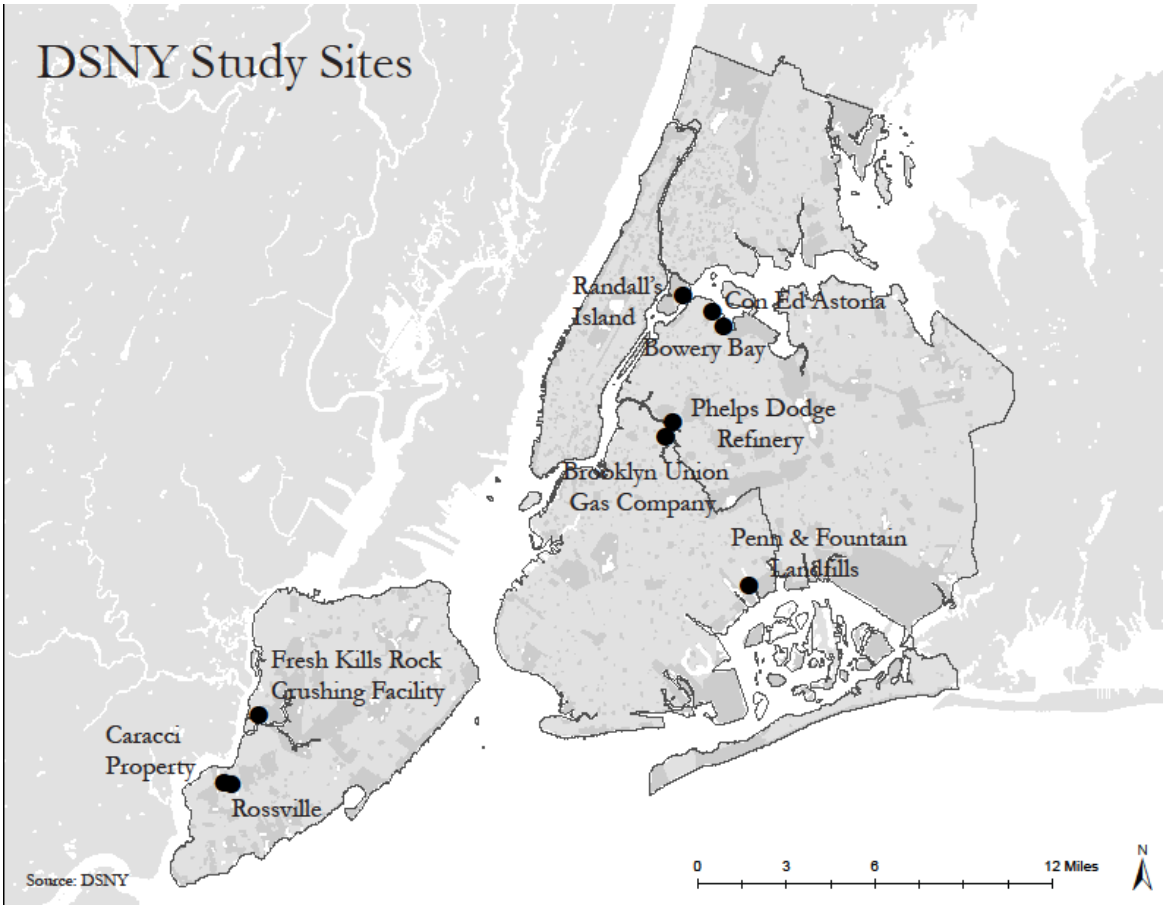
I attempt to differentiate between Environmental Justice concerns and NIMBY issues through a combination of informal interviews, status quo bias tests and quantitative analysis. Environmental Justice concerns will spring out of a larger presence of existing waste sites, as well as larger percentages of minorities and low income residents in a proposed area, while NIMBY oriented reactions will be shaped by the scale and technology of the proposal at each individual site. In addition, I believe the nearby business community will be particularly supportive of the proposals as many stand to gain new sources of income. The interplay between Environmental Justice and NIMBY is not always clear, and I will attempt to differentiate between the two and show how they each affect waste policy discussions. I will also examine if siting a waste-to-energy plant in an EJ community is necessarily a burden. Many countries see such facilities as benefits and it may be possible that they provide more benefit than harm.

Background

The "Evaluation of New and Emerging Waste Management and Recycling Technologies, Phase 3: Demonstration Project Sting Study and Preliminary Investigation" (Phase III) siting report, prepared by the consulting firm ARI as a study for DSNY, acknowledged the inherent issues in New York City's waste process and ident possible sites that would meet basic geographic criteria for a renewable waste facility.[1] These are identified in the table and map below.

Owner	Name	Zoning
NYC DEP	Penn & Fountain Landfills	M3-1
National Grid	Brooklyn Union Gas Company	M3-1
FDNY	Randall's Island	M3-1
Phelps Dodge Refining	Phelps Dodge Refinery	M3-1
Department of Small Business Services	Bowery Bay - along 19th Ave	M1-1
Con Ed	Con Ed Astoria Complex	M3-1
DSNY	Fresh Kills rock Crushing Facility	M3-1
Department of Corrections	Rossville Site	M3-1
Roy A. Caracci	Caracci Site	M3-1

[1] ARI, 2012



These sites are located in four of the five boroughs in New York City, notably avoiding the Bronx, which has had a long history of Environmental Justice issues. There are potential problems with each of the nine sites and none is likely to escape NIMBY or Environmental Justice related complaints.

Several parties point out the benefit of a biogas facility for the city as a whole. A Columbia Earth Institute Capstone Report argues that the facility will save the city money by reducing garbage export, provide clean energy and fertilizer and recycle organic waste.

The Columbia researchers are quick to point out that modest facility digesting 1.2 million tons per year can supply 151 MWH of power and generate about $12 million. However, they too offer no prescription for where such a facility could be located and what kinds of obstacles it might face in order to become a reality.

Siting of Locally Unwanted Land Uses (LULUs), generally those with an adverse effect on local residents like a waste site or sewage treatment plant, has become increasingly difficult as community reaction has grown stronger. However, these types of sites are required for municipalities to provide basic services. In the case of siting LULUs, the literature is unable to provide a satisfactory general answer, deferring to unique conditions of different localities.

The New York City Department of Sanitation (DSNY) takes this a step further. While assessing the benefits of a potential facility, they attempt to identify several sites in the city that meet certain geographic criteria. Their criteria are based entirely on regulatory processes and technical needs, for example, excluding flood zones from consideration, locating in an industrial zone in accordance with the zoning code and the size of the lot for practical needs. DSNY asked their consultants to consider potential social issues, but they brushed aside any concern about Environmental Justice (EJ) or equity in scoring the sites.

DSNY Background

The agent principally involved in this decision and this kind of planning for New York City in general is the Department of Sanitation. DSNY was founded in 1881 as part of a street cleaning effort and soon took over waste control as well. The Commissioner, currently John J. Doherty, is in charge of the agency and directly oversees several deputy commissioners.

These include engineering, long term export, legal affairs, finance, public information and community affairs, support services and recycling. He also works closely with a First Deputy Commissioner, who oversees various directors.

Over time, the agency became responsible for 35 municipal landfills and 32 municipal waste incinerators, as its principal task.[2] These were not all planned by DSNY, however. Several were planned by Robert Moses as City Planning Commissioner, and Mayor Ed Koch attempted to plan another one.[3] Planning for incinerators, particularly in more contemporary times, has come from mayoral order and passed on to DSNY for regulatory process and eventual operation. The most recent conversation about a waste-to-energy plant, as well, was sponsored by Mayor Bloomberg and handed to DSNY for public bidding. Nonetheless, DSNY will be the lead agency through the regulatory processes involved, and their community outreach in past projects is likely to predict their future outreach efforts. A recent example includes the permitting of the controversial East 91st Street Marine Transfer Station. The permit required a ULURP application for building out of its zoning envelope. DSNY did its requisite annunciation of public hearings, choosing to publish notice of a informational meeting in the *'Our Town'* periodical[4], but appear to have done no additional outreach. This means DSNY has performed information, scoping and comment sessions, but hardly solicited the community, and only in English at that. This point will be expanded later.

[2] Rizzo and Plumb, 2012
[3] Stohr, 2013
[4] DSNY, 2004

Literature Review

Addressing the concerns of the community is not just an altruistic nicety. Mitigating some of the identified impacts and addressing the community will be required for the regulatory approval process which may also serve to generate political support (or, if done incorrectly, controversy) for the project. Any such facility will undergo the SEQRA and CEQR processes, both rigorous state and city environmental review process that will include several public meetings and efforts to mitigate some impacts. Depending on the local zoning, the proposal could also be subject to the city's Uniform Land Use Review Process (ULURP), which involves additional scoping and public meetings.

In regards to SEQRA, siting a waste-to-energy plant, regardless of whether the technology is new and environmentally improved, will probably be classified as a Type I Action, meaning that it has the potential for significant adverse impact on the environment. A Lead Agency will be assigned, usually one that has oversight in the area. For a biogas plant, this will probably be either NYC DSNY or NYS DEC. The facility is also likely to receive a positive declaration on its required Environmental Assessment Form, which will require it to undergo the SEQRA process. There will be an option for Formal Scoping, which the applicant should take as a means of sensing resident and stakeholder concerns early in the process. The applicant would then issue a Draft Environmental Impact Statement (DEIS), which then undergoes a mandatory public comment period. Following that, the applicant must address all comments in a Final Environmental Impact Statement (FEIS), which goes back to the Lead Agency for final approval or denial.

New York City's CEQR process is similar. Siting a biogas facility will also likely be a Type I action under CEQR regulation, which requires an Environmental Assessment Form.

A positive declaration from the Lead Agency will also require the full CEQR process. There are two required public comment periods, one public scoping meeting and a review of the DEIS write-up. Finally, as in SEQR, the FEIS is compiled and is approved or disapproved by involved agencies.

In addition, there is a new process of regulation that may apply to any proposed biogas facility in New York City and State. Article 10 of the Public Service Law, passed in 2011, requires any facility that would generate more than 25,000 Kilowatts an hour to undergo its review process.[5] The New York State Board on Electric Generation Siting and the Environment oversees the process and issues Certificates of Environmental Compatibility and Public Need to authorize construction and operation of major electric generating facilities. Based on the calculations provided in the Columbia University Earth Institute Report, the 450 tons of waste per day proposed in the RFP would work out to 21,000 Kilowatts annually, which would be below the Article 10 threshold. But any other major facility or the proposed 900 tons per day expansion in the RFP would likely exceed the 25,000 annual Kilowatt level in Article 10. The process is approximately 12 months from application to determination, with a possible six month extension and extensive pre-application phases. Included in the review is a mandatory Public Involvement Plan to be written up by the applicant, which requires the applicant to perform public outreach well before the review begins until its final phases. It also requires an Environmental Justice analysis around the proposed site, with a minimum of a half mile radius. This would be quite extensive in New York City, and as my research will show, is impossible to avoid in city limits. The defined criteria for Environmental Justice is any area that is 51.1% minority

[5] New York State Department of Public Services, 2011

(i.e., non-Caucasian by self-identification) or where 23.59% of the population earn under the federal poverty line, as reported by the census for the year 2000.[6]

Through these three processes, which will most likely be required of any facility attempting to convert waste-to-energy by any method, the public will have multiple chances to profess their opinion and identify negative impacts. Such a facility could be approved even with negative impacts unmitigated, but the political backlash will be difficult to surmount. Christopher Rizzo and Michael K. Plumb writing for the New York Law Journal suggest using Community Benefits Agreements (CBAs) as a means of minimizing negative reaction.[7] Such agreements have been used in several controversial land use approvals processes in New York City in the past, notably the Atlantic Yards deal and for the new Yankee Stadium, but the legal status is gray at best. CBAs are not codified or named in any regulation and are, as of the publishing date of this paper, untested in court. There is an additional question of if the community groups who sign on to the CBAs have legal standing in court to challenge any violation of these agreements by the developer.[8]

Another team at Columbia University's School of International and Public Affairs (SIPA) also took a look at the inherent siting issues for a generic anaerobic digestion facility.[9] They note that the environmental review process will likely involve additional discretionary permitting from state and city agencies. The particular permits include Water Supply and Water Discharge permits, which will be regulated by the New York State Department of Environmental Conservation, as well as Waterfront, Air, Noise, Solid Waste,

[6] NYS DEC, 2013
[7] ibid
[8] New York City Bar Association, 2010
[9] Burant, Menten-Weil, et al, 2012

Plumbing and Hazardous Substance permitting, with shared jurisdiction between city and state agencies.[10] All of these categories will require various public review processes and stakeholder engagement that will determine how DSNY or the private company should go about their planning and consultation procedure.

While the role of the community in participatory processes has been strengthened, so has the polarization of waste siting in the last several decades. A Baruch University report surveys the role of Environmental Justice in New York City waste planning, noting the concentration of waste facilities, like transfer stations, in poor and minority communities as well as the increasing role in community advocacy groups in defeating new proposals.[11] After years of complaints and protests, DSNY finally adopted a "Fair Share" agreement in its 2006 Solid Waste Management Plan, which mandates site reviews that consider effects on neighborhood character and existing facilities.[12] While it is a win for equity, as well as the poor and low-income neighborhoods that have tended to bear the burden of transfer stations and truck traffic, it complicates efforts to site any new facility. In a diverse city of 8 million, it will be extremely difficult to find a location that satisfies all the technical and Environmental Justice criteria. This mix of needs and people make it extremely complicated to avoid confrontation with communities and may well be unavoidable. DSNY and any other parties working to site a renewable waste-to-energy facility will have to be sensitive to all these needs moving forward.

The growth of NIMBYism has become a full-fledged phenomenon in American communities, an outgrowth of a period during which technocratic planners were given vast

[10] ibid
[11] Baruch College School of Public Affairs, 2011
[12] ibid

power for urban renewal projects that many people did not want. But the power to check planners often goes abused by residents who want to stop any and all progress, leaving many localities in a status quo limbo.

In part, this may be due to a powerful status quo bias, which is a strong attachment to the way things currently are, and also impact bias, in which people overestimate the impact that negative factors will have on their quality of life. Nick Bostrom and Toby Ord chronicle these psychological effects in “The Reversal Test: Eliminating Status Quo Bias in Applied Ethics,” defining the status quo bias as "an inappropriate (irrational) preference for an option because it preserves the status quo"[13]. Through several scientific experiments, collected by the authors, they show that people have an often irrational concept that the status quo is the optimal point, often in spite of overwhelming evidence to the contrary. The authors define the impact bias as “the argument from risk,” speculating that “If it is suspected that the potential gains from varying the parameter are quite low and the potential losses very high, it may be prudent to leave things as they are."[14] Further, “The fact that it may be easier to vividly imagine the possible downsides than the possible upsides.”[15]

Bostrom and Ord’s work is converted into a planning context by Doig (Salon, 2012) writing for Salon, examining NIMBY issues in the West Side subway expansion in Los Angeles.[16] Examining these psychological motivations help determine why people respond in a negative manner to projects that purport many benefits and minimal costs. The author

[13] Bostrom and Ord, 2006. P 658
[14] Ibid, p. 658
[15] Ibid, p. 668-669
[16] Doig, 2012

suggests that taking the time to step back, more extensively study alternatives and hold more meetings to address public concerns could help appease unwary neighbors.[17] Mitigating residents' concerns, like disruptions and other unpleasant effects can help move a project forward.

Michael Dear (JAPA, 1992) outlines NIMBYism and several factors planners can use to work with residents to more peacefully dissolve differences and site necessary facilities. Dear defines NIMBY as "the motivation of residents who want to protect their turf.[18]" More formally, NIMBY refers to the protectionist attitudes of and oppositional tactics adopted by community groups facing an unwelcome development in their neighborhood. Residents usually concede that these "noxious" facilities are necessary, but not near their homes, hence the term "not in my back yard."[19] More broadly, Dear states that a NIMBY movement can have three stages, youth, maturity and old age. During youth, the movement forms after the announcement of a project that residents are opposed to, often confined to a small group of vocal residents. In maturity, battle lines are solidified and dialogue moves into public forums for approval. In old age, the movement can go on for quite some time, either reaching a point where both sides give concessions or a long drawn out battle to either the death of the project or the defeat of the NIMBY group. Dear posits that NIMBY arguments usually fall into three categories, "the perceived threat to property values, personal security, and neighborhood amenity."[20] Interestingly, the geography of the conflict, depending on the scale and type of use, is usually confined to the immediate vicinity or

[17] ibid
[18] Dear, 1992
[19] ibid, p. 288
[20] Ibid, p. 290

project area. It is strongest, Dear notes, within one or two blocks, with awareness declining to indifference after about six blocks.[21] Factors likely to be important in community response are client characteristics, the nature of the facility, the structure of the host community, and local planning considerations.

Boholm and Ragnar stress the need to engage the public early and often in the planning process for successful development.[22] In a case study that looked at a failed attempt to site a biogas facility in Sweden – a country usually very supportive of even waste-to-energy facilities - where the public rejected the proposal due to lack of engagement and distrust, as well as concerns about odor, traffic, potentially adverse effects on the landscape and the scale of the facility. The authors stress that NIMBY concerns often revolve around the risk and uncertainties of the proposed project and even though the public generally views renewable energy favorably, that is no guarantee of success as other local issues trump those concerns. Further, citing Carlman, they differentiate between genuine conflicts, where the developer and the public agree on the effects but disagree on the mitigation, and false conflicts, where the public has a mistaken idea about the effects.[23] Most disagreements tend to be a combination between the two, but the two extremes offer a working framework for assessing NIMBY issues on a spectrum causes.

Any attempt at siting a renewable waste-to-energy plant in New York City will need to consider all the complexities involved in the public process, by carefully evaluating the sites' effects on surrounding communities, engaging the public, addressing their concerns

[21] ibid
[22] Boholm and Ragnar, 2004
[23] ibid

and attempting to forge a broad coalition that will help the project move forward instead of pushing through lengthy lawsuits and bitter neighbors.

Research Design and Methods

I will test the hypothesis using both qualitative and quantitative data.

Quantitative Methods

On the quantitative side, I will be using ArcGIS to assemble a sense of which sites might present equity issues, and therefore serve as more legitimate reasons for opposing the facility. It will also determine where proposals will face tough challenges to meet regulatory criteria.

I will construct a picture of income and race at the census block group level, and facility density across community districts and in block groups in New York City. Using ArcGIS, I will assemble data into a three maps.

I will assemble a map of income, race and DSNY facilities in ArcGIS into census block groups and community districts. I will cross-reference with online sources to remove DSNY facilities that do not play a direct role in the movement of municipal waste (e.g., office space). Using the remaining locations, I will determine density by community district, as well as a city-wide average that will serve as the baseline to determine which districts are overburdened. Similarly, I will input race and income data and determine percentage of total population by census block group.

These data will be compared to survey results to determine if race, income and overburdening play a role in community sentiment about the renewable waste-to-energy proposal, as well as draw parallels to waste and renewable energy site planning.

Qualitative Methods

On the qualitative side, I will be conducting structured informal interviews with stakeholders located near each of the nine locations determined by the DSNY Phase III siting study. These stakeholders will include community board members, non-profits, businesses and groups that have an interest in the waste-to-energy sites. Community Board members will be identified by selecting boards where sites have been proposed and speaking to the appropriate committee chair. Groups and other non-profits are identified

as those involved in Environmental Justice initiatives, identified in the press, or having been involved with DSNY's Fair Share policy. And businesses will be identified by analyzing GIS data a half mile around the sites and attempting to speak to 10-15 businesses chosen at random, where they exist.

All of these sites are located within manufacturing districts, as that is the only location where zoning would allow a waste facility, usually several blocks away from residential neighborhoods. Following Dear's advice, that "awareness declin(es) to indifference after about six blocks," I modified the qualitative design to focus more on stakeholder sentiment.

I aim to use these questions to structure an informal conversation with stakeholders at each of the sites and collect responses and data, which will help determine the perception among stakeholders and if there is status quo bias present.

Once the surveys are collected, I will categorize the results and assess the expressed sentiments. Where possible, I will determine what the main categories of opposition and major issues in siting. They will be compared with the quantitative data to assess if income, race and overburdening play a role in community opposition, or if stakeholders' feelings err more toward NIMBY sentiments.

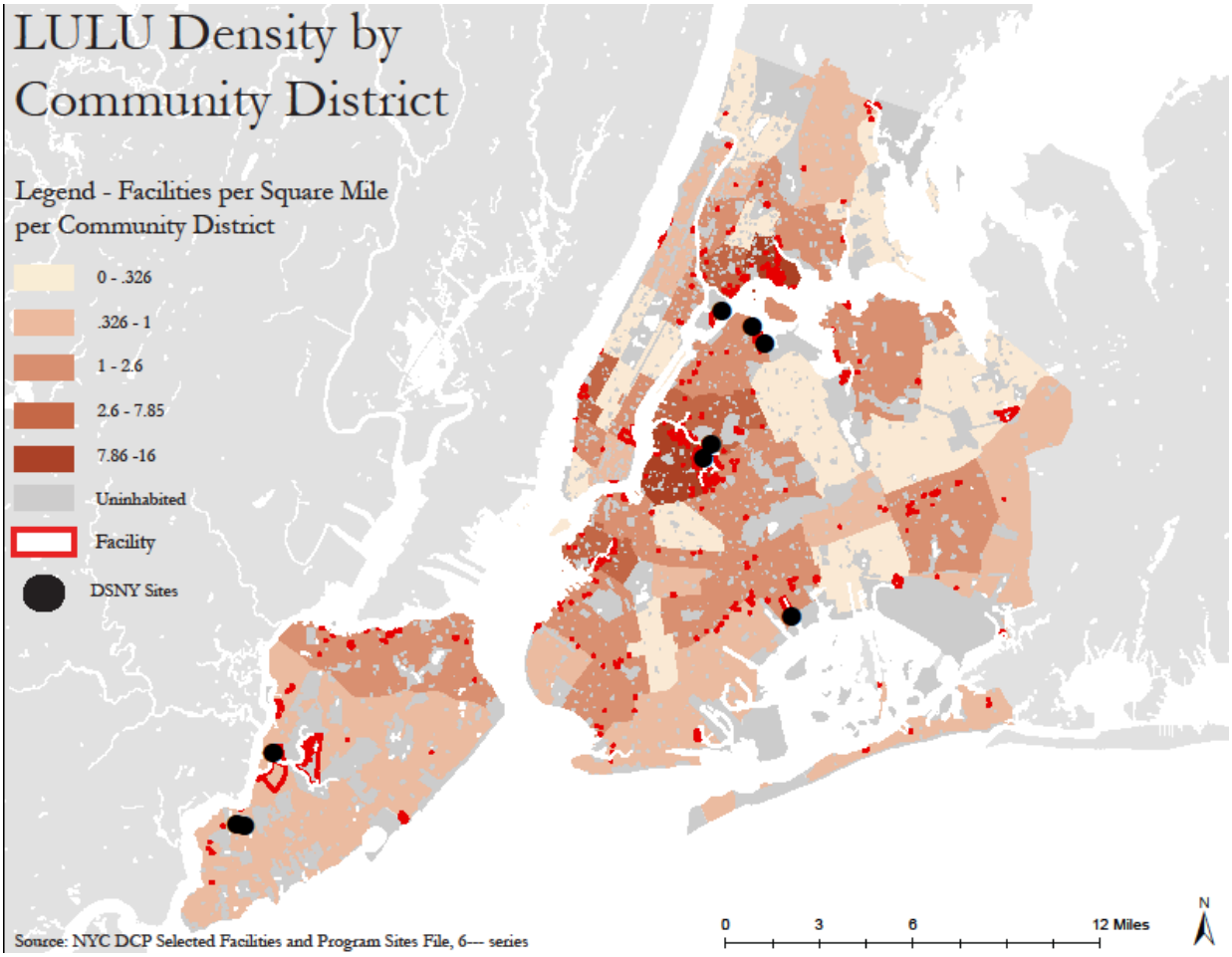
Limitations

I had previously attempted to interview residents near the sites. But, after attempting to discuss the proposals at the three sites in Staten Island with about 75 residents, only one person was significantly interested to discuss the proposal with me, and gave me very little information. Interviews and feedback from people on the site would have provided a better

understanding of those who would be directly affected by the proposals, but given the feedback I initially received, I decided to base the research more on stakeholder interviews to gain a sense of general feedback about waste-to-energy and on the proposals where possible.

Findings

Overburdening

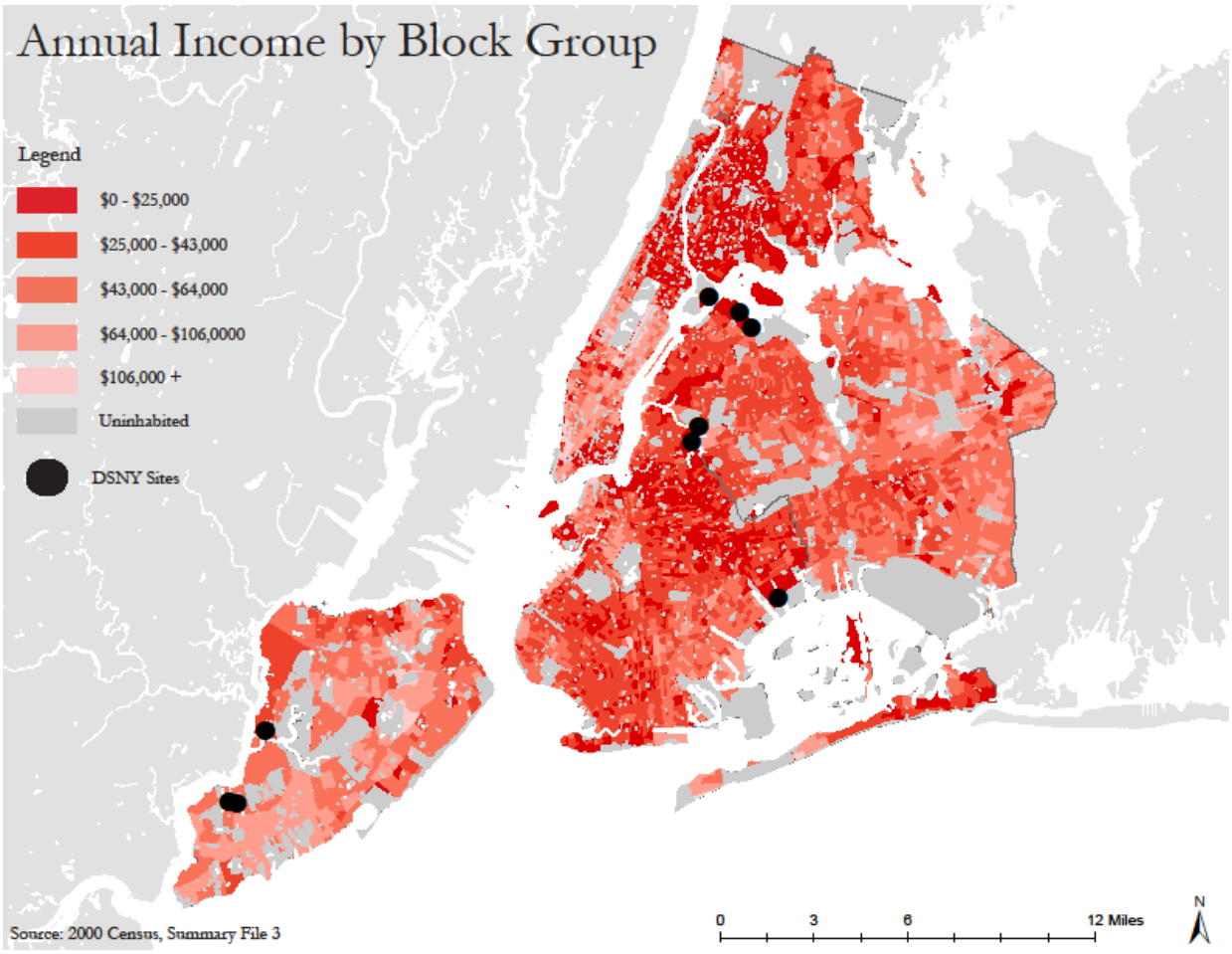


This map displays the density of Locally Unwanted Land Use facilities by community district, which are defined as DSNY sites involved in waste handling and the Department of Environmental Protection sewage treatment plants, together grouped into the 6--- category by DCP's Bytes of the Big Apple Public Facility Listings. The city-wide average number of such facilities is 6.7 facilities, and the average density per community district is about 1.7. Any community district over this level represents a possible overburdening in the community. This map shows that many of the sites are located in high facility density areas,

particularly as a result of coastal districts tending to bear more of burden than inland ones. Most notable is that Brooklyn Community Board 1, the location of the Brooklyn Union Gas Company Site, has the highest facility count in the city, with 54 undesirable facilities, and the second highest density. Phelps Dodge, Bowery Bay, and Con Edison Astoria, Penn & Fountain Landfill and Randall's Island sites also have higher than average facility density scores. That means all of the Brooklyn, Queens and Manhattan sites are at risk of overburdening the community. Randall's Island is a special case, given its location on the island and detached from the rest of Manhattan Community Board 11 and may not be perceived by residents to pose as big a threat. However, my stakeholder analysis was unable to determine how residents and stakeholders would react to the site. Additionally, it may also be a concern for residents of Queens Community Board 1, who reside just across the East River from the site.

All three Staten Island sites, however, are in below average density districts and, from the perspective overburdening, appear to be the least problematic places to site a plant.

Income

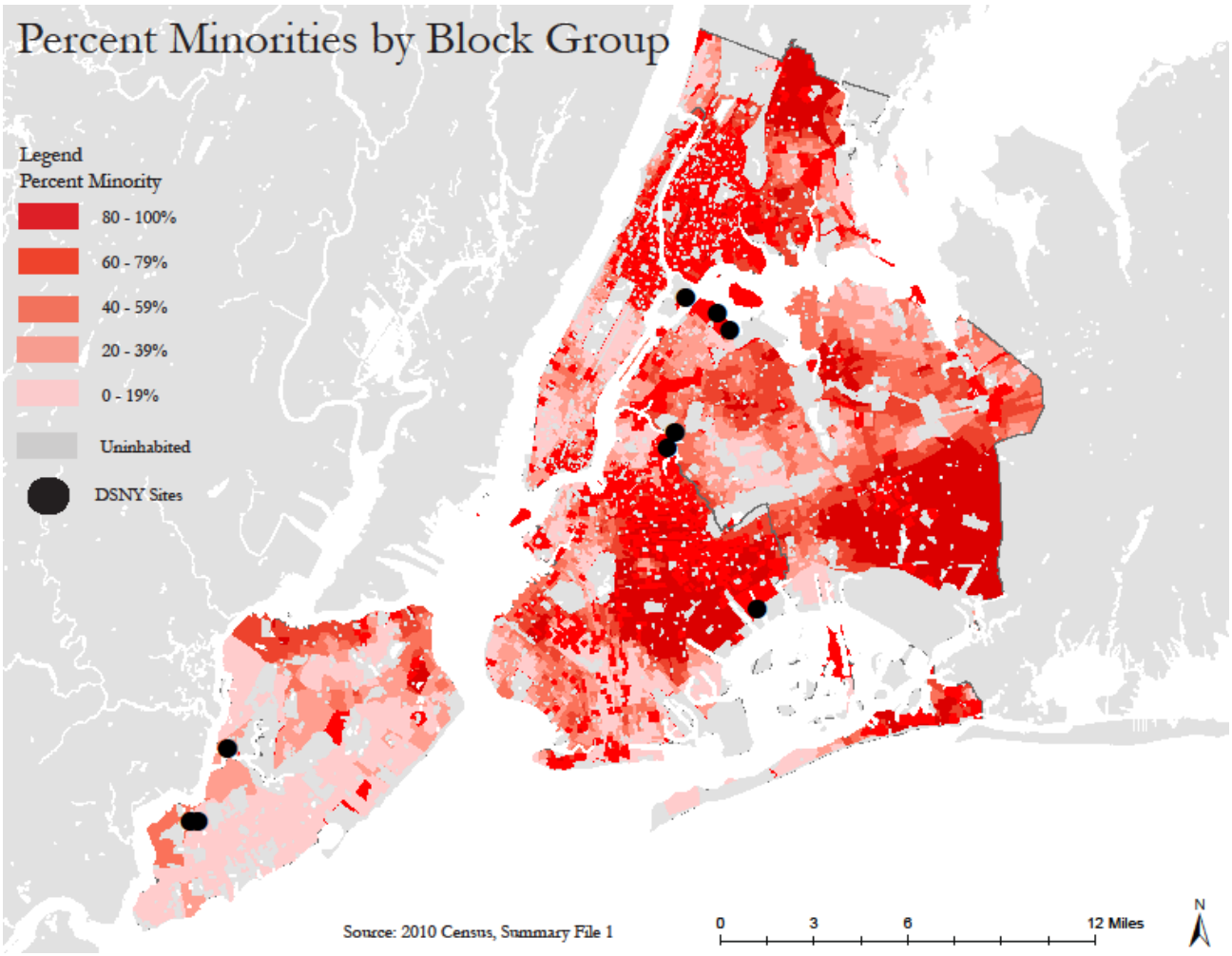


Equity issues related to income are indeed a problem at most sites. All three Staten Island sites are located in districts with at least median city-wide income. However, the Manhattan, Brooklyn and Queens sites are all located in areas with median annual income between at or just above poverty level. The block group level analysis is hard to generalize, but the presence of low income areas near most of the sites is a potential problem. As I noted above, any block group with 23.59% below the poverty line will trigger and Environmental Justice review under Article 10. Even above this level, there is a risk that a waste-to-energy plant would unfairly affect low income communities. Once again, the

Randall's Island site in Manhattan is a special case, given that it is on Randall's Island and is difficult to determine how residents would react to the proposal.

From the perspective of income, any of the three Staten Island sites appear to be the least problematic in siting a plant, in that there are substantially less low-income communities located around them.

Race



Overburdening minorities with waste facilities is a real concern at most of the sites. Both Brooklyn, the Manhattan site and all three Queens sites are located in areas that have upwards of 60% minority population, which raises Environmental Justice issues. Facilities

sited in these districts may negatively impact minorities and will certainly face an uphill battle in the regulatory processes.

Particularly notable is that the Staten Island sites are all located in areas that have less than a 40% minority population. Once again, Staten Island appears to be the least problematic location to site a waste-to-energy plant.

Quantitative Summary

All three Staten Island sites sufficiently avoid income and minority population characteristics and overburdening problems. These sites are the least likely to draw a criticism about unfairly targeting traditionally disenfranchised groups. As I will examine below, there is still a strong opposition to siting in Staten Island, but as far as Environmental Justice is concerned, these sites would not unfairly affect low income and minority communities.

The Randall's Island site might also be considered as an option that would not unfairly affect minorities. The Island is host to a psychiatric ward with about 1,300 patients and may very well draw opposition from them, but, according to Michael Dear's 6 block rule, it appears that the Manhattan Community Board 11 and Queens Community Board residents might not as concerned as those at other sites. However, this site is much less favorable than the Staten Island sites as it still registers above average in terms of overburdening, income and minority presence. Any plan at the site would trigger a full Environmental Justice review under Article 10, which serves as one way to measure its impact on the community. Despite its location on the island, it may draw opposition from

nearby communities. However, I was not able to determine the extent to which residents and stakeholders were concerned about the site during this thesis.

The three Queens sites and the two Brooklyn sites are the worst possible options that could be chosen from an EJ perspective. The Brooklyn Union Gas Company site area has the highest number of LULUs in the city. The three Queens sites chosen - the Phelps Dodge Refinery, the Con Edison Astoria and the Bowery Bay sites - all fall within low-income communities and communities of color, by a wide margin. And the Penn & Fountain Landfill site in South Brooklyn is surrounded by block groups that register below the poverty line, as well as contain high minority populations. All of these sites pose significant Environmental Justice issues and would be a major concern for permitting moving forward.

Stakeholder Interviews

I attempted to contact many stakeholder groups and have been in touch with several, including the New York City Department of Sanitation, who will be overseeing the process; Hank Asher at Covanta which operates several existing waste-to-energy facilities; Nicholas Themelis, the Director of Columbia's Earth Engineering Institute and an expert in waste-to-energy technology; Tammy Gammerman of the Citizens Budget Commission, which filed a report on New York City waste last year; and Staten Island Borough President John Molinaro's office. I was not able to get in contact with the vast majority of people I reached out to and businesses were particularly challenge to reach. I contacted 34 businesses but either no one was available to speak or, as was more often the case, the business was not interested in discussing waste-to-energy plants. I can only speculate as to

why, but it appears that it was either not a priority concern for the owner or they were too busy to give me their opinion. This limitation was also pronounced among non-profit organizations and community boards. As such, I was only able to get in touch with about ten individuals and may not have been able to adequately assess stakeholder sentiment on waste-to-energy planning. I have included below the groups I managed to speak to and have attempted to substitute a survey of news and media articles where necessary.

I spoke with Sarah Dolinar of DSNY, who is the Environmental Review/Contracting Officer in the Long Term Export Bureau. Ms. Dolinar was unable to give me an update on the process, as the RFP is still under consideration and the agency does not provide information about the number or contents of proposals received. She did, however, indicate that they would not be pursuing constructing a facility on their own. Ms. Dolinar cited capital budget constraints; the agency said it would not be able to afford to build such a plant. That means the cost and majority of decisions will be left entirely to private developers. Answering my question about public commentary on the RFP so far, Ms. Dolinar noted that she received a few letters from Staten Island elected officials and community boards. They sought to determine whether the RFP proposed any non-Phase III report sites, which they do not, and whether any sites not named in the Phase III report on Staten Island were selected, which she could not disclose. She also noted that community reaction has been widely reported in the media, which was decidedly negative. In terms of specific outreach methods, Ms. Dolinar notes that DSNY follows Environmental Justice policy guidelines developed by DEC. She did not say whether DSNY attempted to engage community boards or EJ areas outside of the regulatory requirements, which suggests there is none.

Finally, to date no information on applicants to the RFP has been released, but it is likely to be a private for-profit company given the business nature and high initial capital cost, though a non-profit organization is not completely out of the question. Ms. Dolinar mentioned that they are expecting to make a decision in the next few weeks.

The Citizen's Budget Commission was able to tell me a little bit more. I spoke to Tammy Gammerman, a Senior Research Associate, who was able to provide me with helpful information. She pointed out that one of the major reasons why waste-to-energy technology was not used on a broader level by DSNY was misunderstandings about the nature of their technology. The notion that plants are polluters is widespread and dates back to residents' experiences with old-fashioned incinerators that existed throughout the region that were ultimately closed down by the 1990s. Citing stricter regulation and improved technology, Ms. Gammerman noted that several studies show low levels of pollution, even from plants that use conventional incineration technology. She also confirmed for me the challenges involved in siting a facility locally. She mentioned past struggles between DSNY and local residents over marine transfer stations, particularly the East 91st Street project that DSNY recently won a several year court battle to build. Truck traffic in particular is frequently cited by residents as a negative factor. She also further elaborated on the nine sites in question. The Freshkills site was removed from the RFP released by the Bloomberg Administration in March 2012 after five weeks facing political opposition. Many Staten Islanders were offended by the proposal to use the former landfill, which is being turned into a park, for another waste related use. Ms. Gammerman offered some recommendations that could ease the intense reaction witnessed in Staten Island.

European cities have used creative design to avoid NIMBYism, including a plant in Vienna, Austria that utilized a colorful façade designed by an artist.

After the RFP was announced in March 2012, many groups expressed a negative opinion about the technology, potential locations and pollution they believed the plant would bring. Chief among them was the New York Public Interest Research Group, which published a letter with dozens of other organizations to Mayor Bloomberg expressing their opinion. They cited air pollution concerns, the technologies proposed and the location of the plant as their main concerns with the RFP. NYPIRG is worried that because there is no commercial-scale application of the technologies proposed in the RFP, the plant may not be viable. They mention that there have been problems in other countries, where such applications are plagued by cost overruns or operations problems, including malfunctions, explosions, shutdowns and accidental releases of toxic gases. However, there is no source for this information or any specific sites mentioned, so these claims cannot be verified. They are also worried that the plant may increase air pollution in a city where air quality is already below regulatory standards in ozone and particulate matter. Air pollution controls and increased truck traffic to the site are among the biggest concerns raised. NYPIRG and other groups also take issue with the potential locations of the site. They believe that "these polluting technologies" will inevitably be inequitably sited in low-income communities of color. These are places where there are already elevated rates of asthma, heart disease and premature death from different causes. NYPIRG believes that a thermal process technology will increase emissions and adversely affect public health.

The political implication of waste-to-energy in New York has even attracted attention from likely mayoral candidates. Public Advocate and candidate Bill de Blasio said

that putting a waste-to-energy plant on the site of the world's former largest landfill (Freshkills) would "set us back to square one." Comptroller John Liu said that community concerns "seems to have been an afterthought." Former Comptroller Bill Thomson said a facility on Staten Island would "undo years of progress." Candidate Tom Allen cautioned that the city should make sure it does not burden any residential neighborhoods of the city. And City Council Speaker Christine Quinn came out against the proposal after she "expressed real concerns about (it)… particularly thermal technologies." Commentary from mayoral candidates has important implications. First, it implies that there is a vocal opposition of residents who do not want to live near such a facility. It also means that if and when the city picks a private organization to build such a facility, it may be closed or pared back under a new administration. The specific concerns of the mayoral hopefuls seem to relate to the location, technology and level of community input involved in the decision, which echo residents' concerns.

The reaction on Staten Island has been particularly negative. There appears to be a sense that the borough has long handled city waste and should not be subjected to any proposal to site a waste related facility there, particularly at Freshkills. Several elected officials have come out against the planning, including Assemblyman Michael Cusick, City Councilman James Oddo and US Representative Michael Grimm. Their combined political pressure resulted in the Freshkills site being pulled from the RFP in April 2012 within a month of the announcement.

I contacted Staten Island Borough President James Molinaro's office, who briefly replied to a few questions. When the news was first released, Staten Island Borough President Molinaro supported the plan. Having been one of the city officials that visited

some plants in Europe and elsewhere, Mr. Molinaro thinks that waste-to-energy is a good idea to help divert trash to landfill. But as the public became aware that the Freshkills site was the only one named as a possible location, Staten Islanders became increasingly angry that their borough would be used for garbage disposal again so shortly after the Freshkills Landfill was closed. Mr. Molinaro adjusted his plan saying that all geographic areas should be considered, and not just Staten Island. Mr. Molinaro noted that many of his constituents are opposed to the plan because they feel ignored by the city, as well as being skeptical of the technology.

Having heard, read and discussed many of the issues shared by stakeholders across the city, I noticed there appeared to be trends in concerns about air pollution and the technology in question. I reached out to several parties who have a background in waste-to-energy in the region, namely Dr. Nicholas Themelis, the director of the Columbia Earth Engineering Institute, and Covanta, a private company that owns several waste-to-energy plants in the region.

Dr. Themelis gave me a background of some of the technical requirements and mitigation technologies in place that might help alleviate a lot of complaints many people have. Dr. Themelis has long been an advocate for Waste-to-energy, citing the improved environmental technologies and the opportunity to reduce the need for garbage landfilling. Dr. Themelis informed me of the hierarchy of waste management. Recycling and composting are at the top. Recycling also tends to cost less than waste-to-energy, dispelling concerns many have raised that using waste-to-energy will reduce recycling.

Dr. Themelis verified concerns that these new technologies listed in the RFP do indeed involve combustion, but he noted that "The only way to get the energy out is combustion. You have to burn it, otherwise you won't get the energy." However, he says that there is definitely a misperception of thermal processes. These plants used to emit mercury and dioxin in high quantities, but with modern emission control systems, very little gas escapes a plant. Most of the plants use a system that sucks air into the plant, which eliminates odors and prevents toxic wastes from escaping. Additionally, about half a plant, in both cost and space, is devoted to treating pollution through different types of equipment. Technologies used by companies like Covanta have led to the EPA calling waste-to-energy the cleanest high temperature source. So much so that, in comparison, diesel trucks emit three to four times more particulate matter and modern waste-to-energy are cleaner than coal plants, cement, and even recycling plants. Dr. Themelis also noted that having one located in New York City would also help reduce the need for Marine Transfer Stations, which do not control for odors and have been contentious in their own right.

In fact, if waste-to-energy is done correctly, it can be a boon for the community. Dr. Themelis points to the 135th Street Waste Water Treatment plant as an example. In order to cool residents' concerns over odors, pollution and overburdening of other such facilities, New York City included various amenities in its construction. Today there is a park, a swimming pool and tennis courts located on top of the plant. Planners should be careful to discern between a bribe to the community and providing a well-designed facility that can provide amenities to the neighborhood. Embracing design and mixing it with public amenities could be a strategy for siting a future waste-to-energy facility.

Summarizing the dilemma up, Dr. Themelis noted: "You do as much recycling and composting as possible. Then two choices: either waste-to-energy or landfill. This is the reality."

Dr. Themelis mentioned Covanta several times during our interview, so I set up a site visit to the Essex County, New Jersey plant to observe how the company operates. Hank Asher, the plant's Business Manager and Trisha Earls, the Environmental Manager, led me on a tour there. This plant operates in a different regulatory environment, generally under the direction of the New Jersey Department of Environmental Protection, but Covanta has a long history of dealing with similar concerns raised by community stakeholders.

The Newark based plant has operated since 1990, handling residential waste from both Essex County and New York City. It handles about 950 million tons of waste per year and its two steam turbines produce 65 Megawatt-Hours (MWH) of energy. About half of the plant is air pollution control systems. Covanta uses negative air pressure to control odors, as well carbon injection to control particulate matter, flue gas scrubbers, a Continuous Emission Monitoring System (CEMS), and a 271 foot tall smoke stack to disperse what little emissions come out of the plant. Ms. Earls noted that the plant is 99.92% in compliance with state and federal regulations, far more than most plants.

Mr. Asher manages outreach efforts for the plant, including public meetings and various programs sponsored by the company. He noted that they have had success by using "multiple methods and multiple channels for outreach," including sending literature in both paper and email form in multiple languages. He also conveys operations and upgrades by using different messages depending on how technical the audience is and what they are concerned about. Top concerns about the plant are generally related to the technologies

used, public health concerns and truck traffic. In regards to the local Environmental Justice community, Mr. Asher noted there will always be issues, but Covanta tries to be open and receptive to the community. The Newark Environmental Justice Alliance has been at odds with the company for several years over implementing a new baghouse, which is the industry standard and more sophisticated than their current Continuous Emission Monitoring System. Covanta plans to upgrade its system in the following year and has begun the permit system to add it, only after it updated its lease contract with the Port Authority. Mr. Asher discussed that for all the outreach they try to do, there are still people who assume ill will, who are looking for Covanta to be doing something wrong. He told me of an instance where a woman was monitoring their radiation permits (a lot of waste has low levels of radiation, generally a result of someone consuming something after an X-ray), and was extremely concerned that the plant received so much radiated material. She also noted that the plant had not registered anything for several weeks according to the state file. It turned out those weeks the plant was shut down following Hurricane Sandy, and that the instances recorded were easily explainable. This example is not atypical though, many residents continuously monitor public records, as well they should, but will rush to negative conclusions when they see something peculiar. With such a contentious facility, people will always assume the worst. Mr. Asher's strategy is to try to be as open and receptive as possible. "Everything is public record," he said, "there are no secrets here."

Stakeholder Summary

Planning for necessary infrastructure seems to be frozen in a status quo situation. Between the nine sites, NIMBYism or Environmental Justice, and perhaps both, are factors. Governments need to be planning for future capacity in order to be environmentally and

economically sustainable. Top concerns from residents are air pollution, the technology and location as it pertains to siting in poor and minority neighborhoods. There is cause for significant concern about the pollution effects of truck traffic, and any plan should be aware of the pollution effects of concentrated deliveries and departures from a plant. They may be in part allayed by relying on rail or barge transport, or they may not represent a real increase in areas where sanitation deliveries are frequent, like marine transfer stations.

Air pollution and technology objections appear to fall into the "false conflict" category identified by Boholm and Ragnar. That is, several of my sources and supplemental research have denounced these concerns as false. Concerns about truck traffic, including air pollution and noise, present a problem that is as yet unanswered from a technical standpoint. But as for the technologies themselves, Dr. Themelis told me that these plants are in fact cleaner than the diesel trucks that cart the waste. Furthermore, a local plant would dramatically reduce the Vehicle Miles Travelled and the emissions of long-haul garbage export. Mr. Asher showed me the elaborate pollution controls systems and verified those claims. The air pollution concerns from the plants themselves, from a technical standpoint, appear to be negligible. Many of these technologies are being tested around the world and in the United States, contrary to NYPIRG's claim. Dr. Themelis told me about gasification efforts at plants in Florida and Hawaii, which is one of the technologies detailed in the RFP.

Many countries in Europe make use of biogas converters, as well as several farms in the United States. In fact, the US EPA has a program called AgStar that helps farms process manure and other wastes in biogas facilities.[24]

[24] U.S. EPA, 2013

Siting, however, falls under the criteria established by Dear, as it poses a threat to property and quality of life. It is also an Environmental Justice concern, as several groups feared the siting would wind up in poor and low income neighborhoods. Those on Staten Island, where EJ is not likely to be a problem at any of the three sites, seem particularly relegated to the NIMBY category. I could not determine if the status quo bias was present at any location, but more research at the Staten Island sites seems likely to confirm its existence.

In regards to concerns about locating the facility in poor and minority neighborhoods, this is a real challenge that people at the New York State DEC are aware of. As mentioned above, the new Article 10 of the New York Public Service Law mandates an Environmental Justice review if certain thresholds are met. This does not guarantee that the plant will not be sited in what is defined as an EJ community, but it will give people the ability to input into the decision making process. From a siting perspective, it does not make sense to site in an EJ community if there is a viable alternative because of altruistic reasons, the inevitable pushback and the likely negative opinions of elected officials. An agency or company must also take into account viable alternatives and demonstrate the site selected is the most favorable one based on a number of criteria. If there is an alternative located more than a half mile outside an EJ community, the plant should be sited there under Article 10 criteria. But that is a difficult scenario in New York City, as I will explain below.

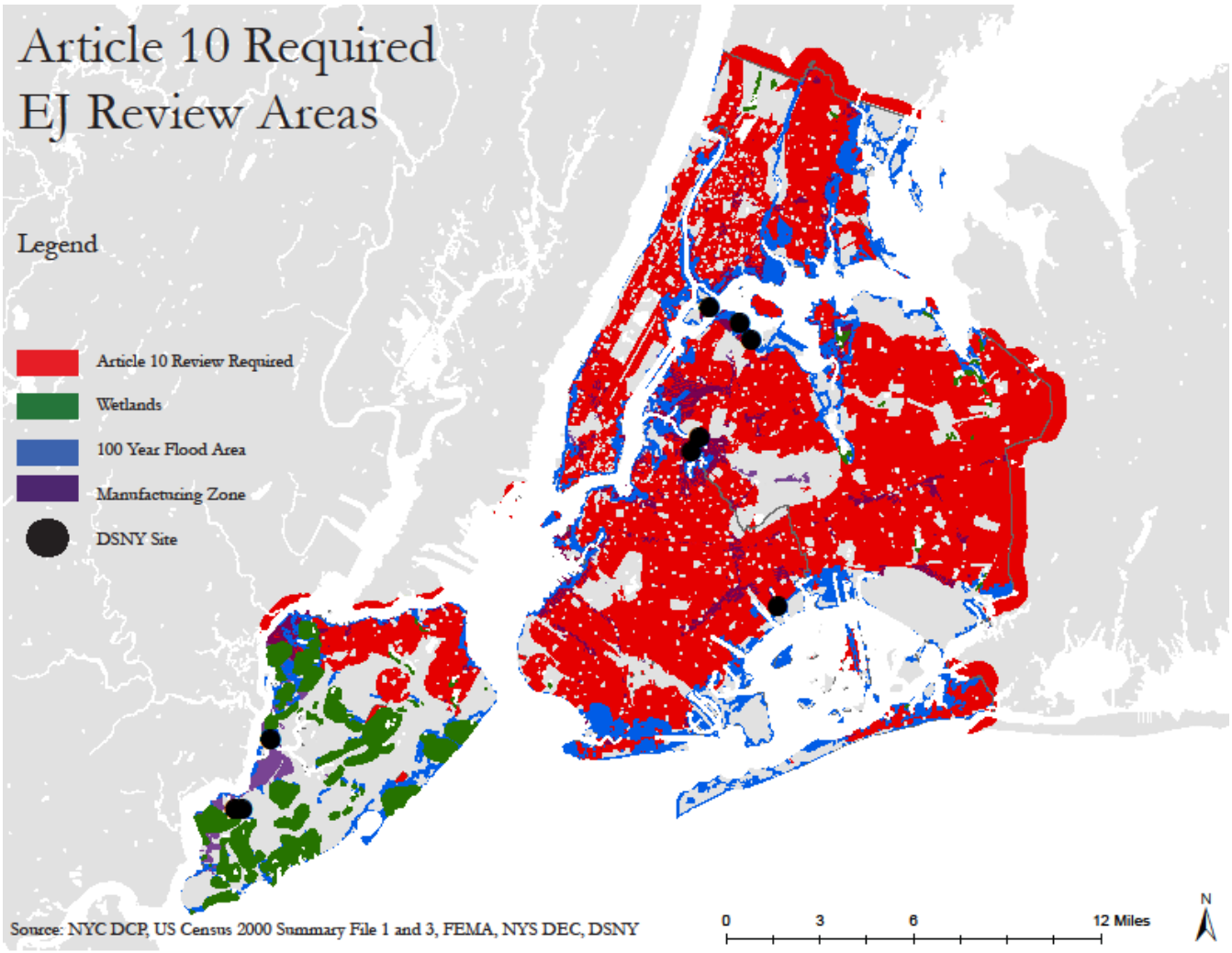
There is also a significant sense of ire over the proposal to use a site on Staten Island, with residents, groups and elected officials feeling that their borough has for too long been overburdened and the site of waste operations. According to the GIS analysis I

performed, this is not true, with all three Staten Island Community Districts coming in well below the city-wide average. But this nonetheless manifests itself in the political debate and poses a significant challenge to siting in the borough that decision-makers may fear opposing.

Can a waste-to-energy plant even be sited in New York City that avoids Environmental Justice communities while meeting basic technical requirements or other siting criteria? And, if not, is there a way to mitigate, calm or otherwise alleviate these concerns without ending in a lengthy legal battle?

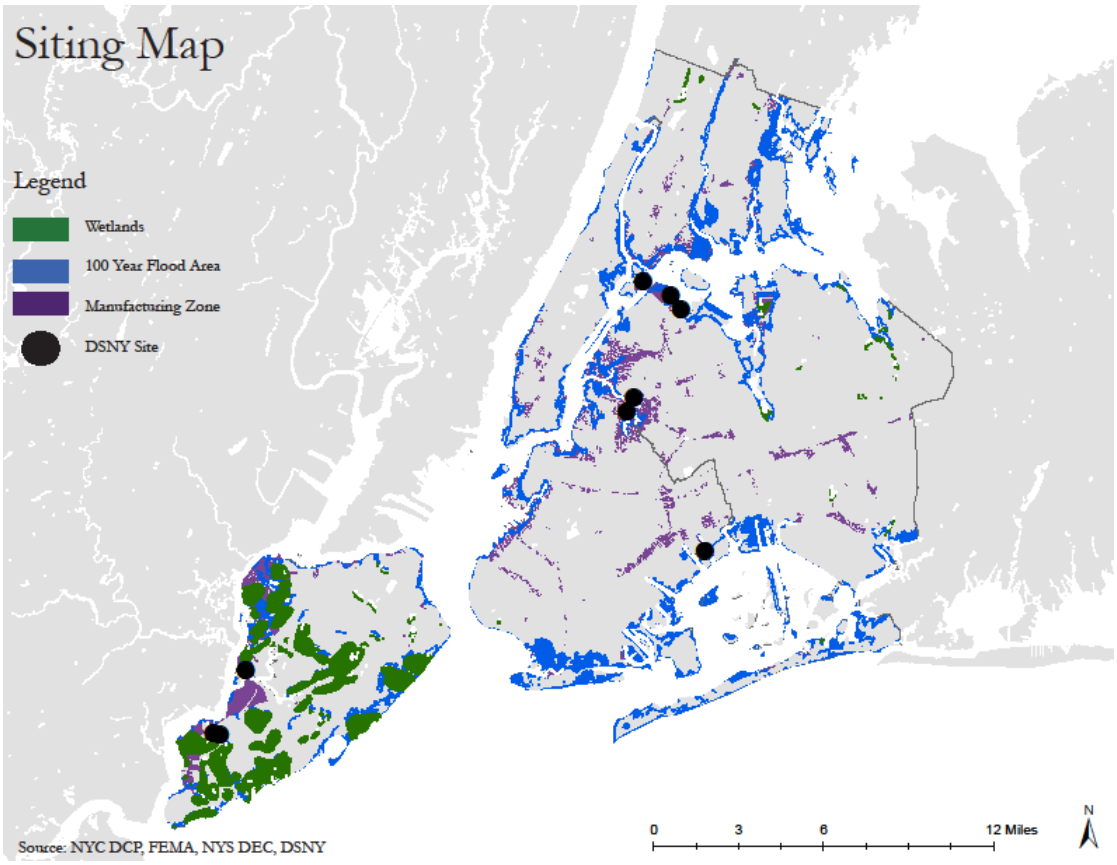
Analysis

EJ communities were identified using the DEC standards for Environmental Justice, in census block groups with more than 51% minorities or where 23.59% were below the poverty line to GIS based on census data. These two census block group files were combined and are shown in red on the map below. I then put a half mile buffer around these districts, which the Article 10 review mandates as the smallest measurement for EJ review. I added files for wetlands and flood zones, provided by the DEC and FEMA, respectively, which met the criteria DSNY used in the Phase III report. Underneath all these layers, I found the industrial zones, a city-wide restriction for waste facilities, for each of the five boroughs to see what areas might not affect Environmental Justice communities and also meet basic technical needs. The map below shows the results.



The results show that there is very little area, let alone industrial zones, that would allow the siting of a waste-to-energy plant without affecting Environmental Justice areas. Note that all but two of the DSNY sites would have to undergo an Article 10 Environmental Justice review process. The only real candidates are located on the western shore of Staten Island. There also appears to be some potential sites in Queens, in the Ridgewood neighborhood, but a half mile around any of those sites would likely trigger an EJ review.

It is important to note that the Article 10 review does not mean that areas deemed Environmental Justice communities are excluded from siting altogether. Applicants are required to perform an Environmental Justice review and determine the potential negative impacts. They are also required to assess several potential alternatives. Planners, developers and government agencies should be sensitive to these communities and ensure they are not overburdened or negatively affected by LULUs. But, given the context of New York City, where the overwhelming majority of four boroughs and about half of Staten Island quality as EJ communities, there may not be a viable alternative. Successfully approving a site in this context will require a community engagement plan that goes beyond the regulatory requirements and utilizes a number of engagement tactics.



The map above applies basic technical needs to examine where facilities could be sited. All areas of the map that are purple, the manufacturing zones (M-1 through M-3, as well as special districts), could be considered for a waste-to-energy plant. Given that avoiding Environmental Justice communities as defined by DEC is extremely difficult, some of the manufacturing zones here might be considered. That is not to say that Environmental Justice concerns should be ignored, but there are a number of benefits associated with waste-to-energy production that may lessen the burden of hosting such a facility.

Global Waste-to-Energy

As mentioned above, it is very difficult to site a waste-to-energy facility in the United States. But combusting waste is common in Europe and in several other places around the world. Why is it different there?

The United States landfills the majority of its waste, about 54% of it. But many European countries, Japan and Singapore, for example, have very low landfill rates and rely much more heavily on waste-to-energy. In Sweden, only 3% of waste is landfilled. So, what is the difference? Why has waste-to-energy been accepted in other countries and not the United States?

The answer lies in a combination of regulatory systems, scarce space, and broader recognition of waste-to-energy as a form of sustainable energy. Indeed, there is still skepticism and NIMBYism about WTE in many of these countries, but they often operate in an environment where problems with landfills are highly visible. Singapore in particular is extremely dense, with very little space available to devote to waste management. The island nation produces about 8,200 tons per day, and manages it with 4 waste-to-energy facilities and one landfill.[25] Singapore manages to recycle 40% of its waste stream. Then it combusts 92% of the remaining waste, with the leftover ash and 4% of non-combustible waste traveling to its only landfill on island an in the bay.[26] There are concerns about health issues and recycling impacts similar to those in New York, but Singapore combusts simply because it has to.[27] The United States has the fortune of possessing an abundance of

[25] Lawrence, C. C., et al, 2003
[26] ibid
[27] Murdoch, 2008

unsettled land, making landfill cheaper and more practical in many areas, particularly in the western US.

In Europe, problems related to poor health and public nuisances related to landfills have become so apparent, the European Union delivered a Landfill Directive in 1999 aimed at drastically reducing the amount of tonnage in landfills by 2020.[28] As a result, many European nations are currently opening and increasing tonnage for combustion waste-to-energy facilities. Some were also ahead of the curve. Denmark, for example, relies on district heating for much of its residents' heat supply.[29] Citizens are used to 29 plants across Denmark at this point, so much so that in one of its wealthiest areas, Horsholm, the plant does not affect real estate prices at all.[30] The promise of cheap, localized heating, traffic separation to ensure trucks and cars do not need to mix, and design work on the factories have created an environment where most people accept waste-to-energy as a neighbor.

The situation is similar in nearby Sweden. The government there has fostered a regulatory environment that supports waste-to-energy. Sweden itself has a carbon tax and takes part in the European Union's carbon trading, both of which make WTE a more attractive option.[31] The EU Landfill Directive and high tipping fees also act to keep garbage away from landfills. Sweden has deemed waste-to-energy a renewable source of energy, something only 24 states have done here. Further dispelling the myth that recycling and waste-to-energy are at odds, Sweden has a 48% recycling rate and a 49% waste-to-energy rate. They may well be a model country for their efforts, both regulatory and market based,

[28] European Union, 1999
[29] Rosenthal, 2010
[30] ibid
[31] Williams, 2011

to create a strong and sustainable waste management system. In fact, it may run too well. Sweden has started importing garbage form Norway and is looking to other neighbors to power their plants.[32]

Suggestions

NIMBYism and Environmental Justice appear to be major issues involved in siting a waste-to-energy plant. But there are several things that can be done at all levels of government and on the part of the applicant to streamline the process and ease concerns. With many projects stalled as a result of these hurdles, it is clear that something is not working. Environmental Justice is a good goal that planners, the government and businesses should hold to, and there are ways to site necessary facilities without risking damage to low-income or minority communities.

Benefits

District Heating

As previously stated, many of the concerns are based upon misperceptions and associations with incineration technologies that no longer hold true. To add to the discussion, there are a number of pros to living near such a facility, as well as a number of things the city and company operating the facility can do to improve its appeal. Most

[32] Owano, 2012

obvious is the production of district heating. Many waste-to-energy plants can produce heat from the leftover steam after combustion that can be used to heat water and nearby residential homes. The practice is common in the Scandinavian countries, with one town in Denmark, for example, producing 80% of its heat from waste-to-energy.[33] Any applicant should be aware that providing district heating could significantly increase the appeal of such a facility. They may also consider providing its immediate neighbors with subsidized or free heat as part of an agreement to site the facility. By itself, steam heat could be cheaper for many properties in the city, many of which currently rely on oil heating. Steam heating from municipal waste can also be readily applied to water heating. Neighbors of the facility would be able to reduce energy bills and some buildings could remove hot water heaters. An existing supplier of heating gas, like ConEdison or National Grid, could buy the steam heat, lay the transmission lines and operate it for a profit, or the firm running the facility itself could provide them.

Economic Development

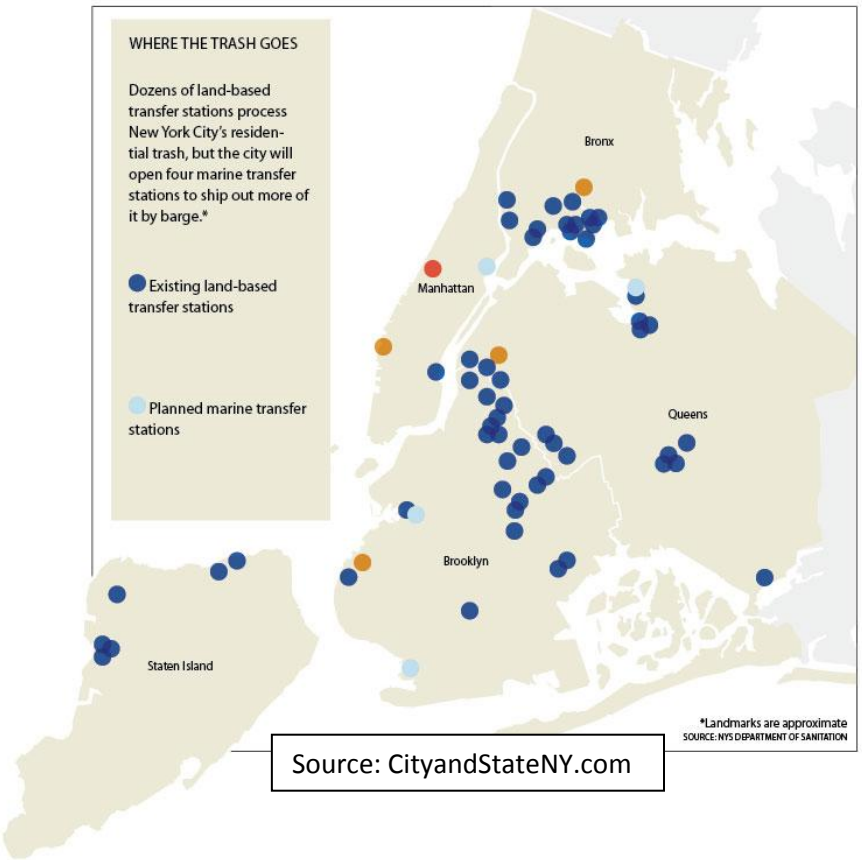
There is also economic development associated with the plant. There will be some permanent jobs, which generally require highly skilled workers, though the number is not very high. The Covanta plant in Essex County, NJ, for example, has 84 workers. But there are also several hundred construction jobs that will provided, as well as the tax revenue from the facility. Additionally, a plant can provide low cost electricity and the above mentioned steam heat benefits, which might reduce business and resident electricity bills.

[33] Rosenthal, 2010

All of the money and jobs spent on a waste-to-energy plant will be kept local, as opposed to landfills which tend to be far from the city center.

Closure of Other LULUs

A waste-to-energy plant provides an opportunity to close other nearby waste facilities. There are a number of marine transfer stations in New York City. If a plant is built near several marine transfer stations, it is likely that many could be closed. This map shows the location of the transfer stations across New York City, which were included in the GIS analysis as well. These facilities do not have the same type of environmental controls as waste-to-energy facilities, like the air pressured system to control odors, and frequently criticized by neighbors as problems.[34] These stations are likely to be more of a problem for public health. Aside from their removal, the truck traffic associated with them is also likely to decrease, which, as I mentioned earlier, is one of the probable causes of asthma and air pollution in many neighborhoods. Marine Transfer Stations, while subject to the same environmental review



Source: CityandStateNY.com

[34] Resnick, 2012

processes, also have less disclosure and public review than a waste-to-energy plant, as well as fewer relicensing requirements. Moreover, they attract more criticism and thus are more closely watched, making regulations all the more salient. It is plausible, then, that waste-to-energy plants would actually result in a more open and transparent waste facility, with more frequent public review.

These facilities are further derided as aesthetically unpleasing and leading to lower property values, which is outside of the scope of this thesis to document. If they are true, siting a waste-to-energy plant could in fact increase the property values in some areas.

Spittelau, Austria
Source: Impressum

Design

Building off property value concerns, there are ways to make a waste-to-energy plant an attraction, hard as it may be to believe. Spittelau, Austria is a good example. In Austria, as in the United States, living near a waste-to-energy plant is generally seen as a negative. But at the Spittelau facility, artist Friedensreich Hundertwasser redesigned the plant after a fire in 1987, creating a vivid, attractive looking facility.[35]

The exterior was covered in artwork and integrated into the urban landscape, now actually attracts tourists and providing an indirect social and economic benefit.[36] At the same time, the facility processes waste and provides district heating for Vienna. Spittelau is

[35] Impressum, 2013
[36] Elburgh, et al, 2010

a prime example of how design can improve community reception. Mr. Asher told me that Covanta's Essex County plant also weighed design decisions which, while not as elaborate as Spittelau, helped make the Newark, NJ facility more attractive. Their plant evokes an American patriotic tone, and is easily recognizable from other nearby facilities.

Embracing a truly creative design may increase the cost of a waste-to-energy facility, but it will also have the benefit of providing increased land values (and thus tax revenue), gaining acceptance of nearby residents, and potentially becoming a tourist destination.

Any applicant should consider the benefits of creating a facility that attracts visitors, rather than community opposition. The city and applicant could formalize the role of design by creating an international competition for a large facility, much like what was done with the High Line. Selecting a noted artist or architect with a vibrant design could make living near the facility a positive and draw people to its gates.

Property Taxes and Land Values

Since there is concern about land values and waste-to-energy siting, one strategy could be for the City government to create a tax abatement that would let nearby residents and businesses claim lost property value against their taxes. For example, if land value for a property next door to a facility decreased by $3,000 in the annual appraisal, the City could allow that resident to deduct that money on the taxes it owes that year or toward future years. Setting up a special tax district, perhaps .25 miles around the site, would clarify the rules. And setting up a number of years for the abatement to run and ground rules could help decrease opposition to its siting.

Activity in Community

Many existing waste-to-energy facilities and companies play an active part in their host's communities. Covanta's Essex County facility, for example, lists 11 organizations it supports through volunteering, donations or sponsorships. Mr. Asher mentioned during my site visit they also run an Eco-Explorer program with Montclair University and work closely with Newark's Sustainability Officer to encourage recycling.

Being active in a host community is a good way to show that the company cares about its location and tries to be open and transparent. It can also confirm their commitment to various principles, like sustainability or recycling. Residents will benefit from the engagement through various services or products volunteered and sponsored. And community groups will benefit from increased capital. As I state below about Community Benefits Agreements, providing grant opportunities could help improve resident and business perceptions of the applicant company as well.

Climate Change Resiliency

Hurricane Sandy is still fresh in the mind of many New Yorkers. In the wake of the storm, many were without power and garbage piled up in the streets with nowhere to go.[37] These problems were compounded by the fact that power comes almost entirely from outside the city and garbage can only be collected to the point that transfer stations fill up. Garbage has to leave the city entirely and when tunnels, bridges and waterfront facilities were damaged, efforts to remove the garbage were entirely hampered.

Creating a facility in the city that can process garbage, with the added benefits of heat and electricity, will increase New York City's resiliency in the face of climate change.

[37] Testa, 2012

Climate change will likely mean more frequent severe storms and seasons, which is a major problem planners will have to solve. We often forget New York City is primarily a collection of islands, except for the Bronx, which means utilities and movement across water bodies is inevitable for most of our basic services. One or more local waste-to-energy facilities promise to increase the ability to provide garbage, heat and electric services from within the city and decrease some of the problems faced in the aftermath of a disaster.

Regulatory Recommendations

Federal and Regional Level

Learning from other countries around the world, there are a number of things the government could do to help decrease dependency on landfills and encourage waste-to-energy production. The US Environmental Protection Agency already recognizes waste-to-energy as a renewable energy source.[38] A national system of carbon taxing or carbon trading would further help increase the appeal of waste-to-energy. Comparative studies suggest that after taking into account electricity production and methane avoided by processing waste into energy, WTE reduces greenhouse gas emissions by 1 ton of carbon dioxide per ton of trash combusted.[39] This means carbon trading plans will increase the financial benefits of waste-to-energy plants.

There already exists a regional carbon market in the northeastern United States, RGGI (Regional Greenhouse Gas Initiative), with nine participating states, including New York. It issues carbon allowances for electric producing plants and operates on a cap and trade model. Although plagued by overestimates of carbon and the resulting low prices,

[38] U.S. EPA, 2013
[39] Psomopoulos, et al, 2009

RGGI has recently announced it would lower the cap in February 2013 and thereby increase the price of carbon.[40] This should incentivize cleaner production of energy, including WTE systems.

The United States should also consider legislation similar to the EU's landfill directive. There is a whole host of problems associated with landfills, including air pollution, ground water pollution, toxic chemicals and wasted methane.[41] Landfills, by nature, also turn useable open spaces into brownfields that may require remediation for future development. Although the United States has vast amounts of open land that could be obtained cheaply, legislating higher tipping fees, taxes, per-mile traveled fees and so on, could help reduce nation's wasteful practice. It could further act as a means of enhanced waste reduction. Further, limiting the tonnage allowed into landfills could raise revenues by the sale of allowances, which could then be used to fund recycling and waste-to-energy plants.

Finally, the EPA has listed an abundance of information about waste-to-energy on its website[42], but the preponderance of misperceptions about WTE suggests that the public is not aware of how these newer types of processing work. If there were some further publicity or push by government agencies and various advocacy groups, it is possible that public perception could begin to shift.

New York State, New York City and the Applicant

There exists a widespread misperception of waste-to-energy on the state and local level as well. Both governments could benefit from convening task forces or citizen

[40] Regional Greenhouse Gas Initiative, 2013
[41] Wegreen-USA.org, 2013
[42] EPA, 2013

committees on waste or waste-to-energy specifically. These groups should comprise multiple stakeholder groups, including those who are against the practice and those who operate facilities to engage in a conversation about the pros and cons of waste-to-energy and share information in a cooperative environment. By working together and communicating its findings back to its constituent groups, the committee can help dispel some of the misperceptions and discuss the remaining issues while maintaining credibility from all angles.

DSNY should work with other city agencies to create a stronger waste system at home. New York City needs to begin figuring out how to process its own waste instead of shipping long-haul freight trucks to landfills as far flung as Ohio and South Carolina. The City's density creates problems for siting waste facilities but, as is evident in Singapore and across Europe, density also creates opportunities. By localizing production, the City can also localize benefits. Dollars spent on tipping fees will pay employees and feed back into the City economy. New York City will also become more resilient in face of climate change, with localized electric and heat production, as well as garbage collection.

Further, New York City should act to be more open and transparent in its planning process, particularly on this RFP. The proposal to site and operate a biogas or other new conversion technology seems to have caught many off guard and the selection process has been shrouded in secrecy. While there are laws regarding the integrity of the bidding process, there has been no benchmark for when the decision would be made, when the applicant would be expected to begin permitting the facility or public input at any level. DSNY clearly anticipated negative public opinion from various stakeholder groups about waste-to-energy, but should have allowed a non-binding public comment meeting to seek

input and hear concerns. This would have established this RFP on an open and transparent basis, instead of making the process seem secretive.

Finally, New York State, New York City and the selected Applicant need to work to make the regulatory processes better understood. The various processes this type of facility will have to file for, which will likely include SEQRA, CEQR, ULURP and possibly Article 10 of the Public Service Law. Given all this alphabet soup, it is easy for anyone to get lost in the requirements and what meetings will be when. It is beholden on the applicant to publicize the meetings, but they should do far more than that. The applicant should create a website and community engagement plan, even if they do not have to undergo the Article10 process, which clearly documents the timeline for the project and gives the general public plenty of opportunities to comment. The State and City government should work to make these processes easier to understand by the general public. There is a wealth of criticism about the SEQRA process and it is understood as far from perfect[43], but improving public input and understanding should be high on the list.

Environmental Justice Recommendations

This paper has put down current Environmental Justice tactics as reinforcing the status quo. But there is, nonetheless, a place for EJ activists. All residents deserve a high quality of life in a safe, clean city. It is obvious by now that poor and minority communities have born the burden of LULUs and that this has slowed significantly after the rise of Environmental Justice.

[43] DEC Region 3, 2010

There are a number of strategies the Environmental Justice movement could follow to remain connected to their ideology without paralyzing waste planning. EJ advocates should continue fighting for equitable siting regulations, as no one group or neighborhood should have to bear the brunt of LULUs. But they should also consider offering realistic alternatives, including physical locations and cost estimates that present a similar expense to a proposed project they disagree with. This way, they can engage in a conversation with policy-makers instead of protesting their actions.

EJ advocates should be more realistic about health concerns which, as stated above, are not so much a threat as those posed by the older generation of incineration technology. They should also find ways to allow innovative technologies that will allow the city to thrive and try new things. What they can do to ensure that their health and safety concerns are met is, instead, to fight for proper mitigation. If, for some reason, no viable alternative can be found and it is within reason that decision makers are selecting a site based on advantageous physical characteristics, EJ advocates should focus on ensuring the facility has adequate mitigation measures. For example, pressure regulators, operators and elected officials to insist on alternatives to truck traffic to a waste to energy facility instead of pressuring for the removal of the proposal. Pressure for the best technological air emissions control systems rather than declaring no waste facilities ever. Given that nearly all of Manhattan, Brooklyn, Queens and the Bronx qualify as Environmental Justice areas, there has to be some degree of acceptance that these facilities need to be put somewhere. No one borough or community should bear an unfair burden, but they do need to be spread across the five boroughs, in both rich and poor neighborhoods, and in Caucasian, African American, Latino, Asian, etc. communities.

Community Engagement

Another group of problems revolve around the methods for engaging and understanding resident and stakeholder concerns. Waste-to-energy and other LULUs are highly controversial and involve misperceptions by the general public and missteps by applicants. Both groups should strive to work together to site these facilities in the best and most practical way possible.

One example of a successful community engagement model is the Cricket Valley Energy plant in Dover, New York, about 75 miles upstate from the City. While permitting their 1,000 MWH electric power plant in 2010, they were required to enter the SEQRA review. The current Article 10 provisions did not exist at the time, but the techniques used for this project are easily replicable. The company relied on "early and often" engagement to address concerns and answer questions on a variety of topics. They help several working groups each on air quality; water, wetlands and wildlife; and traffic and safety from February 2010 to October 2011. They also created a website where they published summaries of meetings, presentations, all of the environmental impact statements and license documents and other information about the project. By being open and informative, as well as providing multiple forums to address concerns and questions from residents, the plant was able to move through the SEQRA process relatively quickly and minimize opposition. Being open with information, engaging citizens early in the planning process and forming a dialogue with people throughout the review process is essential for the success of any project, and any party formulating a waste-to-energy plant in the city would be wise to follow this example. There are a variety of additional tools that can be employed

during this engagement process. There is no one key to success, but using a combination of the following will help ease community concerns and contribute toward an active conversation that will ease NIMBYism and address Environmental Justice issues.

Community Benefits Agreements

Community Benefit Agreements (CBAs) are one way to get residents to support a project. As mentioned above, a developer, in this case the organization planning the waste-to-energy plant, will contribute resources toward the community in exchange for project approvals. Recent New York City examples include the new Yankee Stadium in the Bronx, which allocated $28 million in grants to community groups[44], and the Atlantic Yards development in Brooklyn, where developer Forest City Ratner promised affordable housing, minority and women contractors during construction, and open space. However, there are many issues with using CBAs. There is no assurance of legal standing for community groups signing on the project and they remain untested in court, so there may be no way to enforce the contracts. There is a possibility the organization signing the CBA may go defunct, as happened to ACORN in the case of Forest City Ratner, meaning that the developer may become legally exempt from the requirements.[45] Finally, CBAs may be conceived of as a bribe to the community by some, alienating some and dividing a community.[46] If done correctly, the developer will commit and construct the agreed upon concession and/or contribute grants to nonprofit, community organizations and will attain the approvals for their project. For waste-to-energy, providing open space, planning to reduce truck traffic by a certain measurement, minority and women owned business

[44] Williams, 2006
[45] Petro, 2013
[46] Barbalace, 2001

contracting, local labor promises and funding for local community organizations. The funding piece seems to be the easiest to enforce and monitor, as money can be immediately placed aside and monitored, whereas other concessions can only happen during construction. Therefore, negotiating some level of community funding during a CBA is highly recommended.

Early and Often Engagement

As was apparent during the Cricket Valley Energy, engaging residents early and often throughout the review process is critical to project success. In SEQRA, scoping is not mandatory, but should always be used a means to register community concerns and decide what information is relevant for the DEIS. I would argue that engaging a community during the pre-certification phase would be even better, as the applicant has a chance to get out ahead of rumors and address concerns quickly. It will also provide an opportunity to ascertain what subjects are relevant and require additional research during the Article 10, SEQRA, CEQR and possibly ULURP processes. These early meetings should continue throughout all of these reviews and go beyond the required meetings, possibly being divided into categories that are of particular concern for residents and holding several such working group meetings. The example in the literature review about siting the biogas facility in Sweden showed the hazards of failing to engage residents early. Without taking the time and cost to engage people, which may not be regarded as essential, the entire project is at risk of failure, and surely that is cause enough.

Ongoing Negotiation

Meetings, styled as working groups, open forum, question and answer, etc, should continue throughout the review process. The applicant should be ready to listen to

community needs and negotiate. This process is not just for relaying information to the community; it is about listening to concerns and negotiating with stakeholders to alleviate real concerns. Discussed above, truck traffic presents a potential air pollution risk. Rather than attempting to write it off or convince residents that it is a negligible concern, opinions should be sought in a manner that allows input into the decision making process, well before scoping even begins.

Open Information and Receptivity

Being open and receptive to residents is critical. By not releasing reports and data in a timely manner, the applicant fosters a sense of suspicion. Suspicion will lead people to regard any actions taken by an applicant as malicious, much as Mr. Asher cautioned. By fostering an open and receptive environment, where information is shared freely and organized in easy to read manner, the public can become better informed while addressing some of their concerns. New York City's RFP process for the waste-to-energy plant has been plagued by secrecy, little to no accessible information aside from a press release and no constructive means for residents to voice their concerns. The applicant should strive to be as open as possible with their plans and allow residents plenty of opportunities to voice their opinions.

Multiple Methods and Message

Reaching out and engaging residents can be difficult. The proposal of a waste-to-energy plant in their neighborhood may jolt some residents' concerns, but raising awareness early and addressing fears is key. The Article 10 review mandates the creation of a Public Involvement Plan. It may be rejected by Board on Electric Generation Siting and the Environment, but it forces the applicant to provide a meaningful way to address the

public.[47] Included in the requirements are a website to disseminate information to the public, notifications and activities designed to encourage participation by stakeholders. It also forces applicants to develop and begin engaging residents and stakeholders during the pre-application phase. The rest is left up to the applicant. What they should embrace is a strategy that incorporates multiple methods and messages. Mr. Asher went over a few tactics used at the Essex County plant, which included publishing literature in different languages, particularly Spanish. They also tuned their message to the audience, for example, providing information on air emissions at the technical level of the audience. As I ascertained during my visit, there is no intent to trick anyone, it is to be as open as possible and provide multiple audiences with the information needed to address their concerns and respond to inquiries.

Any applicant looking to site in New York City will need to incorporate that kind of philosophy into their Public Involvement Plan and should also embrace the plan for SEQRA, CEQR and ULURP. The applicant should include an interactive website, where the general public can ask questions, as much documentation as possible, in multiple languages, and also print literature for those who do not have access to the internet. Providing literature and links about specific concerns, notably air pollution, traffic and technology used should help inform residents who may then contact the applicant or attend a public meeting.

Public Meeting Format

There are multiple types of public meetings that are designed for different types of groups and issues, as well as suggested methods of how to conduct a meeting that is beyond the scope of this thesis. But there are a few suggestions that the applicant should

[47] New York State Department of Public Service, 2011

try to engage the public and have a meaningful discussion about the critical issues involved in planning a waste-to-energy plant.

Formal public meetings are one option, and are the format of all the review process required meetings. They allow for citizen input and allow citizens to ask questions of representatives. But they can also be intimidating to residents and can be dominated by those who are more comfortable with speaking in public.[48] These formats will have to be used at least several times, but other public meeting styles may be considered.
Open houses, workshops and forums provide an opportunity for the applicant to display information about the facility and approvals processes required. They may also be used for one on one discussion with representatives of the company or organization that can be friendlier and more open than in a formal style.

Focus groups and small group processes allow applicants to speak directly with stakeholders who have a vested interest in the project. Discussing issues openly with the Environmental Justice community, nonprofits and business may provide a better format for back-and-forth exchange of information and concerns, helping to better mitigate pollution or design elements.

A mix of all these public meeting formats should be used to ensure the community has the proper opportunity to give input on the waste-to-energy proposal and for the applicant to address and mitigate concerns of all groups.

Public Education Campaign

A public education campaign will also be required to change how people perceive waste to energy, particularly as they seem to be dwelling on the image of incinerators form

[48] Municipal Research and Services Center of Washington, 2013

the 1990s. The campaign should strive to change the debate from NIMBY to maybe in my back yard if… or even 'Yes In My BackYard." The message should be crafted to show the environmental degradation of landfills, the currently preferred method and destination for the overwhelming majority of the waste. Further emphasis should be placed on trucks traveling through the city loaded with garbage and suggest waste to energy combined with recycling as a more attractive alternative. Finally, the campaign should show people the benefits of waste to energy and how people might get involved.

A combination of television advertising, bus shelters and subways, mailers, and internet media should be utilized with carefully crafted messages and attractive graphics. Multiple languages should be addressed, particularly English, Spanish, Chinese, Russian and other languages that have a large number of speakers in New York City.

The best possible sponsor would be a public agency, particularly the one most associated with waste, DSNY. However, the political risk might be seen as too great to craft a campaign from a public agency. In that case, companies like Covanta might consider taking the campaign on their own, showcasing their 'Energy from Waste' system and how its changed dramatically over the last few year alone. Nonprofit and advocacy groups might also be interested in taking on the issue, particularly those who profess environmental sustainability or fiscal sustainability, like the Independent Budget Office. Finally, a combination of these groups could pool resources to operate a broader public campaign.

There are a number of resources to build a successful campaign and many private organizations excel at marketing.[49] Following some of the tips provided can improve the method outreach, as well as better understand the people in the target market. In this case,

[49] California DPR, 1998

that is New York City and multiple messages will have to be crafted for the diverse metropolis. The sponsor may also consider partnership mechanisms, special events, youth education and appealing to media coverage as additional strategies. Further, a follow-up assessment should be performed to measure how successful the campaign was in changing opinions. Sources show that these strategies can be successful in changing behavior and public opinion.[50]

Priority and Phasing

Phase I

There are several options that are possible now. Creating a task force or committee of concerned stakeholders representing both sides of the debate, as well as elected officials and other decision makers, should be convened immediately. This group should study and discuss how waste to energy works and in under what conditions it might be agreeable for it to be applied in the city. The group should attempt to work out the major issues identified by this thesis and attempt to come to terms, filing a final position report. Second, a public education campaign should also begin as soon as possible. It could be initiated by DSNY, Covanta and other private firms, or nonprofit and advocacy groups that support waste to energy, or any combination of the above. The campaign should attempt to dispel the myths about waste to energy, particularly those about air quality and technology. Location of a facility will have to wait until later, as that issue is much more difficult to tackle, particularly from a public education campaign standpoint. A broad campaign that

[50] American Psychological Association, 2012

utilizes several media and multiple languages would best serve to illustrate how waste to energy can be a benefit to communities, while also serving as a means of building salience and soliciting early feedback.

Third, a landfill limit or ban passed by either the state or the city seems to be feasible at present. New York City officials appear to realize the cost and problems associated with landfilling the vast majority of the city's waste stream. The City Council, Mayoral action, or DSNY self-imposed quotas could set benchmarks for reducing landfilling over a twenty year horizon, much like the broader European Union legislation passed in 1999. There is likely to be a pushback by businesses and stakeholder groups involved in the current disposal system, but the majority of residence seem to either have very little knowledge of or concern about where their waste goes. At the state level, action by the governor or the state legislator could reduce communities' reliance on landfilling their waste as well. State level legislation may be more difficult, as there are a number of businesses that work in the transportation and storage of waste. The broader constituent base and variety of municipal disposal methods will also make limits or bans more complicated. A limit is more politically feasible than an outright ban, particularly if limits are set near current levels of waste. It may also create a system of tonnage trading, like carbon credits, which in turn could be taxed to support recycling and waste prevention efforts. Limits should be reassessed every several years to ensure a steady decline in the amount of waste landfilled. At the federal level, it seems out of the realm of possibility that a limit or ban could be passed, given the vast amounts of waste landfilled in the United States, as well as the amount of open space. Nonetheless, a feasibility study should be undertaken by the EPA, at the very least.

Phase II

These suggestions are not likely to happen in the near future, given the political risk associated with these steps. However, after the introduction of Phase I recommendations, it will become more politically feasible. It will also depend on the new Mayoral administration in New York City, given the election in 2013 and many candidates' stated opposition to Bloomberg's policies. Mayor Bloomberg only has about 7 months at the time of this thesis left in his term and will likely not be able to achieve significant headway on these recommendations.

The introduction of new carbon trading or tax systems, or expansion of the RGGI system to additional industries, will incentivize waste to energy while increasing tax revenues for the governments involved. By taxing the amount of carbon or other greenhouse gases produced by landfills, waste to energy may become comparatively cheaper. The low carbon levels associated with waste to energy will add an additional revenue stream, that of carbon credits, further incentivizing their construction and operation to handle waste.

Recognizing waste to energy as a renewable energy source has been controversial in New York State. Environmental Justice groups are quick to dismiss waste to energy as a renewable energy source. New York State considers recovering energy from solid waste its third priority in waste management, following waste reduction and recycling.[51] It does not, however, consider waste to energy a renewable energy source, which would open up the possibility of additional investment, tax credits and other benefits. An attempt to classify it

[51] NY State Environmental Conservation Law, 1994

as such was beaten back by EJ advocates several years ago.[52] Classifying waste to energy as renewable will increase the economic appeal of the technology, resulting in a more widespread use. It will also help change the public perspective on waste to energy as a polluting technology.

It may also not be politically feasible for some time to reform the city's bidding process to make it more transparent. Given the history of corruption in bidding, there are certain legal safeguards that hold the process generally undisclosed from public scrutiny until a decision is made. However, agencies generally have no timeframe for release or benchmarks that hold proposals accountable for the public. DSNY's process for the bid on waste to energy was released over a year ago, with a few question and answer sessions directed toward interested applicants. There does not seem to have been much of an opportunity for public review, which seems to be more of a tactic for avoiding political risks and expediting the proposal than a well thought out attempt to include the public. Reforming the bidding process should include several benchmarks for the release of updates and a timeline to either drop the bid or make a decision. The city or individual agencies should also release criteria on what the applicant is expected to do in the years ahead. Lack of transparency fosters public distrust.

Phase III

With some combination of the above phases, ideally all of them, the city will be well on its way toward the creation of a localized waste system. Waste reduction and recycling efforts will remain important, and the city and DSNY need to continue their efforts to decrease waste and increase reuse. But it also needs to happen on a local scale. New York

[52] Themelis, 2013

cannot rely on the past stability of shipping its waste out. Local recycling and waste to energy need to become a priority to create a city that is truly sustainable financially and environmentally. And given the above recommendations, this can also be achieved in a way that fosters sustainable communities.

Limitations and Further Research

There are a number of limitations that could have improved the findings and a number of topics outside the scope of this thesis that would be interesting topics in their own right. The major limitation of this thesis is the inability to adequately assess stakeholder sentiments. I had trouble reaching out to the number of people I hoped to reach over the course of this study. Included in the appendix is a list of contacts that I attempted to get in touch with, all of whom were contacted at least twice and many four or more times. There appears to be a challenge in soliciting stakeholders for comment on planning issues, as I know I am not alone in my cohort with this issue. Many people are too busy or the topics are too niche for their discussion. A better design methodology would account for the fact that there would be an extremely low response rate, but I was unable to predict that. I attempted to fill in the gaps with media accounts of people interviewed at the time of the RFP but I do not feel that adequately assesses public perception, especially at the individual site level. Planners attempting to engage the public in future research projects should note this problem and find ways to more actively seek public comment.

There are also a number of things I wish I had more time to research. Not having a technical background, I was unable to adequately review and discuss the different types of waste-to-energy techniques that exist today for this thesis. Discussing, dissecting and

analyzing several types of technologies and their varying potential for approval on several sites would make an interesting follow-up.

Carefully examining geographically diverse planning examples where projects transcended NIMBYism and worked closely with EJ groups would also make an interesting topic. This problem is certainly not local to New York City, as I have pointed out. And it appears that the best solution depends on local context. But it would be helpful to see what further generalizations can be gleaned from an assessment of successful projects that faced controversy during their planning process.

A full review of various community engagement techniques was outside the scope of this thesis. I touched on a few examples that can be used work with communities to lessen the controversy in siting LULUs, but a full review of various techniques would be a helpful addition to the literature. There are numerous articles and books about the applicability and success of different engagement techniques and meeting styles. Applying these to remove NIMBY related controversy and engage in meaningful EJ discussions has immediate real world applicability.

Finally, a full critique of the constraints imposed by the regulatory framework and their success in achieving their aims was beyond the scope of this thesis. I touched on the constraints of Article 10 of the Public Service Law, SEQRA, CEQR and ULURP and briefly discussed some common problems, but this is a topic in its own right. There are a number of authors who have published work on this subject, but discussing these regulations' impact on Environmental Justice would help further the regulators' and stakeholders' efforts to make meaningful discussion and cooperate.

CONCLUSION

New York City's garbage crisis is beholden to a paralyzing status quo. Between NIMBYism, Environmental Justice, existing regulations and misunderstandings, creating a waste-to-energy facility in the city is nearly impossible. Residents are concerned about the type of technologies used, air pollution and the location of a facility in any proposal. There appears to be a large degree of "false conflict" among many stakeholders, particularly among Environmental Justice Advocates, the resolution of which should help further cooperation between planners and the general public. There is also pronounced NIMBYism about the location of the plant, evident in the protectionist attitudes towards property values and quality of life.

These concerns are not unique to New York. Many other localities across the country and the world face similar issues in siting locally unwanted land uses. Landfills are running out of space and garbage needs to be shipped ever further from our urban centers. Even if waste can be reduced and recycling rates are maximized, challenges in their own right, there will be additional refuse to dispose.

Waste-to-Energy plants present a viable alternative and, with the technologies available today, they are cleaner than many other features of the urban environment. The aversion to these plants will persist. Lengthy environmental reviews and legal battles are persistent problems in the existing regulatory environment, but planners, developers and stakeholders can work together to negotiate a location and operation strategy. Stressing the benefits, offering discounts and abatements, and resolving false conflicts through a mix of community engagement methods can encourage stakeholders and planners to achieve a positive resolution for everyone.

We have a choice, we can continue paying ever higher prices to export waste further and pollute greenfields, or we can work together to site improved technologies and dispose of waste locally.

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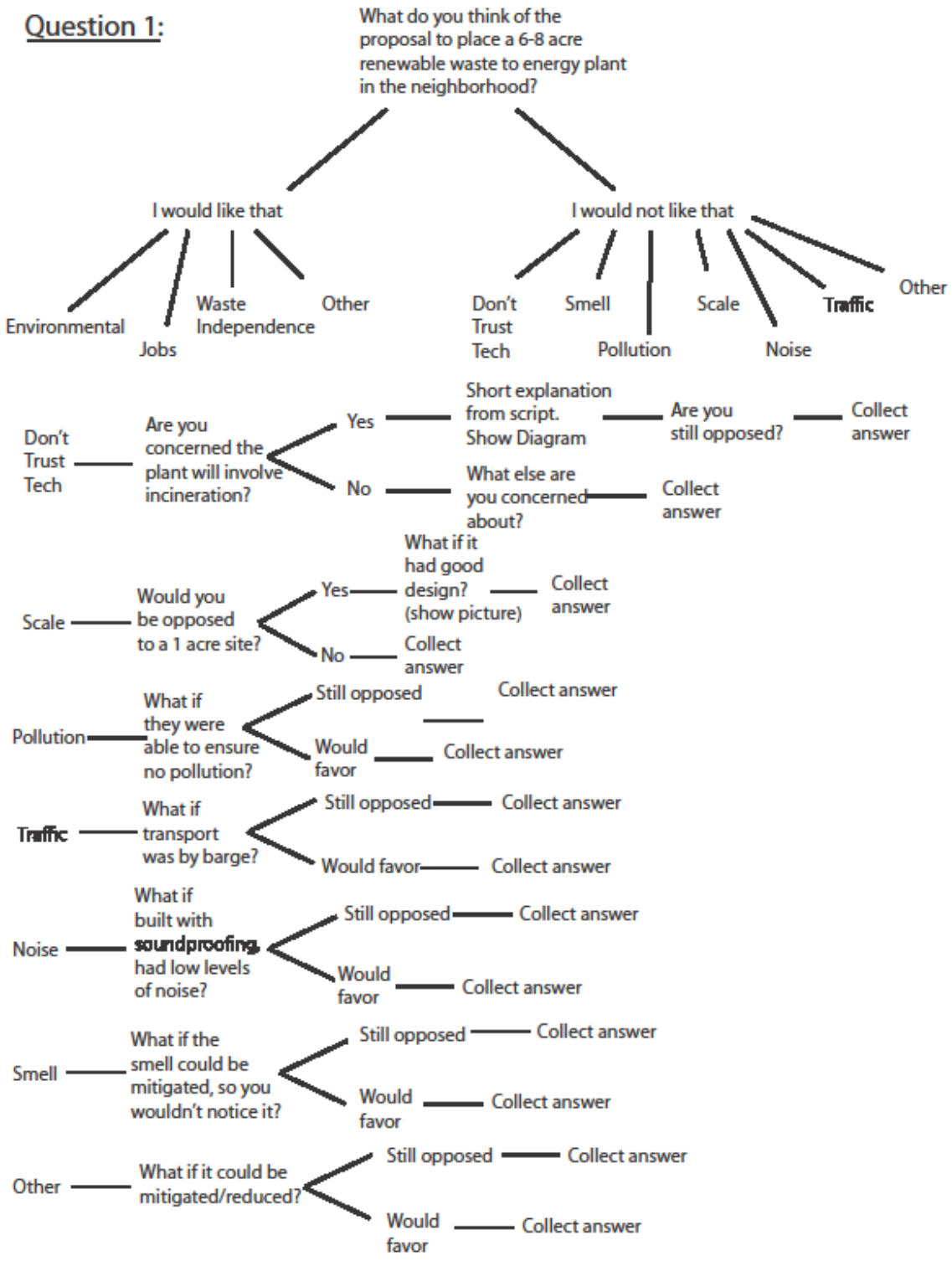
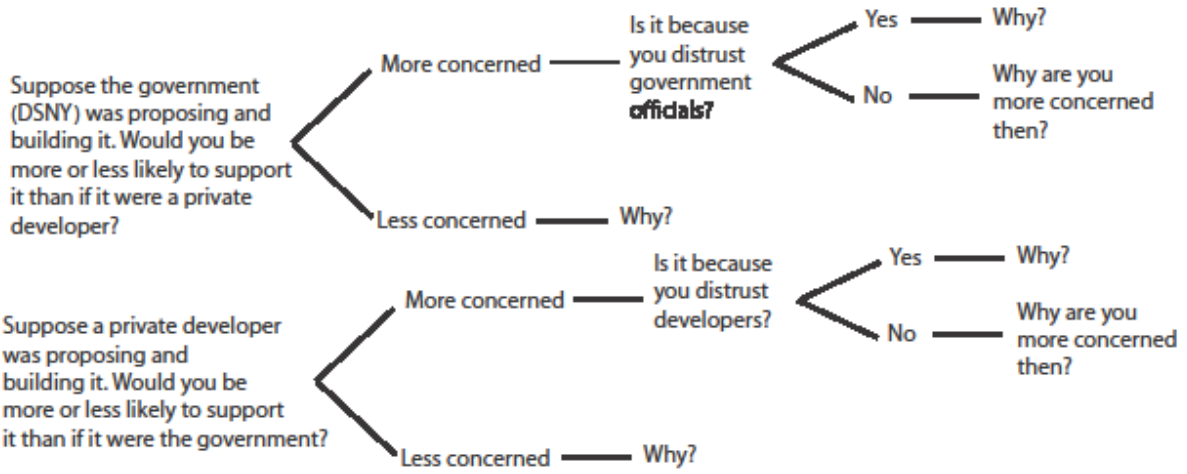
Appendices

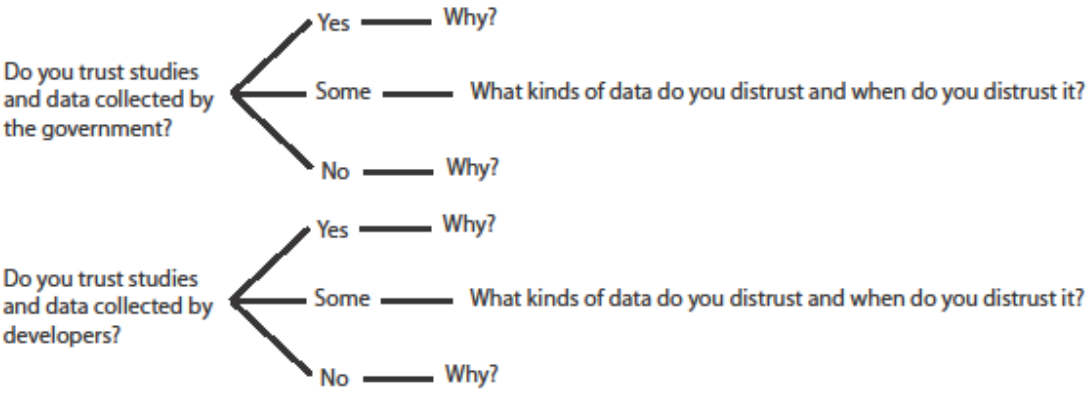
Appendix I – Decision Tree



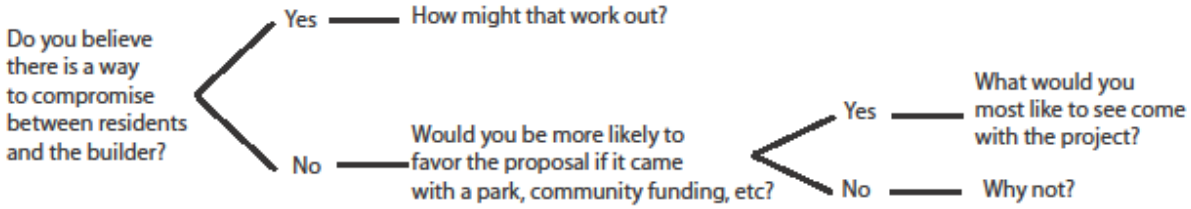
Question 2:



Question 3:



Question 4:



Question 5:

Do you believe your community is already overburdened?

Question 6:

How would you like the builder to reach out to residents to understand what you do not like about this project?

Appendix II – Contact List

The following is a list of the individuals I attempted to contact over the course of this thesis. Contacts in bold represent a successful contact who provided information for my thesis and contacts in italics represent a contact who I spoke to or responded to me by email but declined to comment.

Name	Company	Title/Site
Generic	ARI, inc	Phase III Siting Study Consultants

Government Contacts

John J. Doherty	*DSNY*	*Commissioner*
Thomas Milora	*DSNY*	*Exec Assistant to Commissioner*
Myron Priester	*DSNY*	*Brooklyn South Borough Chief*
Thomas Doyle	*DSNY*	*Brooklyn North Borough Chief*
Joseph Andrews	*DSNY*	*Manhattan Borough Chief*
Thomas Albano	*DSNY*	*Queens West Borough Chief*
Ralph Reed	*DSNY*	*Staten Island Borough Chief*
Daniel Klein	DSNY	Office of Real Estate
Adam Conanan	DSNY	Director, Fresh Kills
Vito A. Turso	DSNY	Deputy Commissioner, Bureau of Public Info & Com
Ana M. Lafe	DSNY	Director, Special Projects
Ignazio Terranova	DSNY	Citywide Community Affairs Officer
Michael Ebert	DSNY	Assistant Commissioner, Planning and Budget
Kitty Dawkins	DSNY	Public Information
Sarah Dolinar	**DSNY**	**Director of Environmental Review**
Marty Markowitz's Office	Brooklyn Borough President	
Helen Marshall's Office	Queens Borough President	
Scott Stringer's Office	Manhattan Borough President	
James Molinaro's Office	**Staten Island Borough Presidents Office**	

Affected Community Board Contacts

Generic Email	SI CB 3	
Edward Canlon	Environmental Chair, SI CB 3	Caracci/Rossville

Thomas Barlotta	Land Use Chair, SI CB 3	Caracci/Rossville
Debra A. Derrico	*SI CB 2*	*Freshkills*
Dana T. Magee	SI CB 2	Freshkills
Generic	Queens CB 2	Phelps Dodge
Dorothy Morehead	Environmental Chair, QN CB 2	Phelps Dodge
Lisa Deller	Land Use Chair, QN CB 2	Phelps Dodge
Generic	Queens CB 1	Bowery Bay/ConEd
Vinicio Donato	Chair, Queens CB1	Bowery Bay/ConEd
Joan Asselin	Enviro Protection chair, QN CB 1	Bowery Bay/ConEd
Generic	Brooklyn CB1	Brooklyn Union Gas Co
Christopher H. Olechowski	Chair, Brooklyn CB 1	Brooklyn Union Gas Co
Ryan Kuonen	Enviro Protection chair, BK CB1	Brooklyn Union Gas Co
Heather Roslund	LU Chair, BK CB 1	Brooklyn Union Gas Co
Generic	Brooklyn CB5	Penn & Fountain Landfill
Nathan Bradley	Chair, BK CB 5	Penn & Fountain Landfill
Generic	Manhattan CB 11	Randall's Island
Matthew S. Washington	Chair, MH CB 11	Randall's Island
George Sarkissian	District Manager, MH CB 11	Randall's Island
La Shawn Henry	LU Chair, MH CB 11	Randall's Island
David Giordano	HHS Chair, MH CB 11	Randall's Island

Field Workers	
Hank Asher	**Covanta**
Larry Evans	Covanta
Liz Howard	**Covanta**
Nickolas Themelis	**Columbia Earth Engineering Institute**

Nonprofit/Community Organizations

Joan Byron	Pratt Center for Community Development
Eric Goldstein	*NRDC*
Kate Kiely	*NRDC*
Joel Kupferman	*NYC EJA*
Laura Haight	NYPIRG
Generic	Coalition Helping Organize a Kleaner Environment (CHOKE)
Generic	Harlem Environmental Impact Project, Inc.
Generic	Greenpoint Waterfront Association for Parks & Planning (GWAPP)
Generic	NYS Department of Environmental Conservation
Generic	Newtown Creek Alliance
Tammy Gammerman	**Citizens Budget Commission**
Generic	North Shore Waterfront Conservancy of Staten Island
Generic	Sierra Club
Generic	Williamsburg-Greenpoint OUTRAGE (Organizations United for Trash Reduction and Gar

	Equity)
Generic	Staten Island Citizens for Clean Air
Generic	Environmental Advocates of New York

Businesses Contacted

IBZ Office	NYC Economic Development Corp	
Generic	*Greenpoint Williamsburg IBZ*	
Generic	North Brooklyn IBZ	
Generic	Long Island City IBZ	
Generic	Staten Island Economic Development Corporation	
Hazen Street Realty	*M business*	**Bowery Bay Site**
Excellent Land Holding	*M business*	
Three V Realty Corp	M business	
Brown Properties, LLC	*C business*	**Caracci Site**
203 Westfield Ave LLC	C business	
Scholastic realty LLC	*M business*	
MVM Holdings LLC	M business	
Three Bros.Estates, Inc	M business	**ConEd Site**
Michael Dellavecchia	M business	
TEI Windsor Properties	M business	
Steinway Realty LLC	*M business*	
1847 Holdings, LLC	*M business*	
Acadia West Shore Exp	*M business*	**Freshkills Site**
Valencia Developers	*M business*	
4384 Victory LLC	M business	
R. Amos Real Estate	*M business*	
HL Land Corp	M business	
Dieci, LLC	M business	
Joseph Gatti	M business	**Brooklyn Union Gas Co Site**
Luis F Sanchez	M business	
307 Realty Corp	M business	
JoeLowe Realty LLC	M business	
LINS United Corp	*M business*	
NY Maspeth, LLC	*M business*	**Phelps Dodge Site**
SOL Golman Investments	M business	
United Parcel Service	*M business*	
Economy Plumbing & Heating Co	*M business*	
Marigold Realty	M business	
Consolidated Gas Co	M business	**Randall's Island Site**
SMR Gateway I, LLC	C business	**Penn & Fountain Landfill Site**
Gateway Center Properties	C business	

Meadowland Estates, Inc	*C business*
Starrett City, Inc	M business
Spring Creek Plaza, LLC	C business