



February 28, 2014
Parks and Environment Committee
City Hall
Toronto, ON M5H 2N2

RE: ITEM 2014.PE26.3 -- Energy Reporting Requirement for Large Commercial and Multi-Residential Buildings

Dear Committee Members:

An Energy Reporting Requirement (ERR) has the potential to generate significant environmental, social, and economic benefits for the City of Toronto. TAF supports the motion put forward by Councillors Doucette, McMahon, Layton, Lee and Carroll, and undertakes to support and participate in exploring and developing a policy and program for Toronto.

Energy-use in the built environment accounts for 50% of Toronto's greenhouse gas (GHG) emissions. In order to reach the City's 2020 emissions targets (30% below 1990 levels), major emissions reductions are required from Toronto's buildings. Our preliminary analysis, based on the experience of other jurisdictions as well as the impact of voluntary energy reporting programs locally, is that an ERR policy for large commercial, institutional and multi-unit residential buildings has the **potential to reduce annual emissions by 350,000 tonnes CO₂eq by 2020**. This would bring Toronto a major step closer to its 2020 emissions target.

Reducing emissions also means energy savings for building owners and operators. Our preliminary analysis indicates **potential for annual energy savings of over \$170M by 2020**. These savings would help to improve housing affordability in both the apartment and condominium sectors, where utilities typically account for 30% of operating costs. In the commercial sector, these savings would also help make Toronto a more affordable and attractive place to operate a business and therefore help attract and retain employers and jobs.

Toronto's citizens and businesses currently spend over \$4B on energy each and every year, the vast majority of which leaves the local economy. Since spending on utilities generates very little employment compared to other types of expenditures, the redirection of \$170M in annual energy savings into the local economy has the **potential to create and sustain approximately 1400 new jobs by 2020**. This is in addition to jobs created by investments in the energy retrofit opportunities identified through ERR, which would also be significant.

An ERR policy will also protect consumers and investors making real-estate investment decisions. Consumers shopping for a car can compare the rated fuel economy of all the models on the market, but families buying a condominium, or investors buying real estate, are not able to access the same kind of relative energy performance information. Making building energy performance information available will **protect consumers and investors while strengthening market pressures for improvements in energy performance**.

A city-wide energy reporting requirement for large buildings would also generate a comprehensive database of building-specific energy use which will be of value to the City, utilities and other stakeholders. For instance, it can improve the City's ability to track progress against its GHG and energy conservation targets and assist utilities in designing and targeting their conservation programs to maximize savings in the least efficient buildings. Energy-use data could also be mapped geographically to assess opportunities for district energy systems or other neighbourhood scale sustainable energy infrastructure.

With the recent updates to the Toronto Green Standard, the City of Toronto has taken a leadership position on energy and sustainability in the new construction space. However, the vast majority of energy use and emissions come from existing buildings, and that's where energy reporting and benchmarking plays a role.

Energy Reporting Requirements (ERR) for large buildings are a well-established best practice which have already been implemented by cities around the globe, including New York City, Seattle and Chicago. We believe that the research and consultation proposed will allow Toronto to build on the experience of these leading cities and allow Toronto to develop and implement a high-quality program for promoting and advancing energy efficiency in our large buildings.

Sincerely,

A handwritten signature in black ink, appearing to read 'Julia', written in a cursive style.

Julia Langer
Chief Executive Officer
Toronto Atmospheric Fund

Julia Langer, Chief Executive Officer

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The Energy Reporting Requirement – A Background Report

February 2014

Executive Summary

Toronto's 2020 Greenhouse Gas Target

Buildings produce over 50% of Toronto's annual GHG emissions, so reducing GHGs from existing buildings is essential to meeting Toronto's GHG emissions target of 30% below 1990 levels by 2020.

Best Practice for Reducing Greenhouse Gas Emissions from Buildings

Energy reporting requirements have met with great success in various jurisdictions in the U.S. and around the world and are now regarded as a best practice for accelerating energy efficiency in buildings.

Existing City Council Direction

The City of Toronto has already directed City staff to evaluate and implement an energy benchmarking program for Toronto's commercial and multi-unit residential building sectors as part of the 2009 *Power to Live Green: Toronto Sustainable Energy Strategy*.

Stakeholder Interest

Multiple stakeholders in Toronto are interested in the possibility of implementing an energy reporting requirement for buildings in the City of Toronto, and TAF received valuable feedback on the topic from a group of stakeholders at the Toronto Atmospheric Fund's 2014 Dan Leckie Forum held on February 21st.

Enabling Technology Available

The U.S. Environmental Protection Agency's ENERGY STAR Portfolio Manager tool, which has become the industry standard for benchmarking commercial buildings in the U.S., has recently been adapted for use in Canada by Natural Resources Canada, who would make it available to Canadian building owners free of charge.

Recommendation

For these reasons, the Toronto Atmospheric Fund strongly recommends that the City of Toronto develop an energy reporting requirement for large buildings at the earliest opportunity. Such a policy would help the City reach its 2020 GHG reduction goals, make energy costs transparent to large building owners and users, generate a potential \$172.5 million in annual energy cost savings¹, and create more than 1480 local jobs².

Purpose

The purpose of this background paper is to provide a foundation for considering the opportunity to adopt an energy reporting requirement for owners/managers of large buildings in Toronto.

What is an Energy Reporting Requirement?

An **Energy Reporting Requirement (ERR)** is a policy that requires the owners and/or managers of large buildings to measure and report their annual energy use. Numerous jurisdictions across the United States and elsewhere in the world have implemented ERR policies, which are sometimes referred to as energy benchmarking, energy rating³ and disclosure, or energy labelling policies⁴.

Typically, ERR policies require building owners to submit annual energy use reports⁵ to a government body, which then analyses the information and makes it available to the public. However, some jurisdictions only require building owners to disclose energy use to buyers, lessees, and/or lenders at the time of transaction (e.g. sale, lease, or loan)⁶. ERR policies also differ in accordance with the type and size of the building. Most commonly, ERRs are used for commercial buildings, but many policies also apply to municipal and multi-unit residential buildings. In most of the U.S. jurisdictions where ERR policies have been implemented, the ERR applies to commercial and multi-residential buildings that have a footprint of 50,000 square feet or greater. However, some jurisdictions have set thresholds at 10,000 square feet⁷.

How Does an Energy Reporting Requirement Work?

An ERR requires that building operators track and report their buildings' annual energy consumption. Based on the information provided through an ERR, a city can create a database of comparable building data, which can be analysed to form an accurate picture of building sector energy use. In this way, building owners not only track their buildings' improvements over time, they can also compare or benchmark their buildings' energy performance⁸ relative to a norm or standard, or to a group of peers⁹. At the same time, investors and consumers are provided with the energy information required to make informed real estate investment decisions, strengthening market pressures for improvement.

Measuring and Tracking Energy Use Leads to Energy Savings

Experience shows that the practice of reporting and comparing energy use leads to a reduction in energy consumption. For example, an EPA study of more than 35,000 U.S. buildings that were benchmarked¹⁰ between 2008 and 2011 found that buildings that consistently reported their energy performance achieved a total of 7% energy savings over that four year period (or an average of 2.4% energy savings per year)¹¹. In the City of Toronto, 2.4% energy savings per year would translate into \$172.5 million in annual cost savings for energy consumers¹.

A 2011 survey conducted by the American Centre for an Energy Efficient Economy (ACEEE) found that 62% of building owners and utility customers in California who registered for utility benchmarking workshops and benchmarked their buildings reported that their organizations changed their energy consumption patterns since they started benchmarking. In addition, 84% indicated that they had planned or implemented efficiency improvements since they started benchmarking¹².

Energy Reporting Requirements in Action

Energy reporting requirements for existing buildings have been successfully implemented throughout the United States and elsewhere, and are now regarded as a best practice for accelerating energy efficiency in commercial buildings. American Jurisdictions that have adopted ERR policies include Austin (2008), Boston (2013), Chicago (2013), Washington D.C. (2008), Minneapolis (2013), New York City (2009), Philadelphia (2012), San Francisco (2011), Seattle (2010), the State of California (2007) and Washington State (2009), as well as the European Union (2002), Australia (2010), Brazil(2007), and China (2008). The tables below profile just a few of those jurisdictions' policies.

New York City	
	(Legislation passed December 2009)
Size and Type of Building Covered:	Commercial, mixed-use, and multi-residential buildings >50,000 ft ² Municipal buildings >10,000 ft ²
Information Disclosure Requirement:	<ul style="list-style-type: none"> Report energy and water use to government annually. Government posts results in an excel spreadsheet on the City's public web site: http://www.nyc.gov/html/gbee/html/plan/ll84_scores.shtml
Rating tool used:	ENERGY STAR Portfolio Manager
First compliance period	May 2010 for municipal buildings May 2011 for commercial, mixed-use, and residential buildings
Outcomes to date:	<ul style="list-style-type: none"> 75% compliance rate in 2012 (up from 64% in 2011) Median ENERGY STAR score increased from 64 to 67 from 2011 to 2012
Interesting aspects of jurisdiction-specific experience:	<ul style="list-style-type: none"> NYC partnered with universities, energy service companies, and the local Green Building Council chapter for assistance with data analysis, technical support, and outreach to building owners¹³. NYC's benchmarking policy (LL84) is one of four regulatory pieces that make up NYC's Greener Greater Buildings Plan. The other policies require that renovations and alterations meet NYC's Energy Conservation Code (LL85), require energy audits and retro-commissioning every 10 years (LL87), and require lighting upgrades and sub-metering (LL88). These policies are supplemented by job training opportunities and financing.¹⁴ City government reports annually on city-wide energy use and trends.

San Francisco (Legislation passed February 2011)	
Size and Type of Building Covered:	Non-residential buildings >10,000 ft ²
Information Disclosure Requirement:	<ul style="list-style-type: none"> • Disclose to current tenants and to buyers, lessees, and lenders at time of transaction. • Report annual energy benchmarking summary (AEBS) to government. • Government publishes AEBS results on a public web site.
Rating tool used:	ENERGY STAR Portfolio Manager
First compliance period	October 1, 2011 for buildings >50,000 ft ² April 1, 2012 for buildings >25,000ft ² April 1, 2013 for buildings >10,000ft ²
Outcomes to date:	The ordinance is expected to result in a doubling in energy retrofits over five years, which will reduce CO ₂ emissions by more than 70,800 tons, and save more than \$600 million ¹⁵ .
Interesting aspects of jurisdiction-specific experience:	To give San Francisco building owners time to understand the energy reporting process and a chance to improve their buildings' performance, buildings' very first AEBS scores will not be published.

District of Columbia (Legislation passed July 2008) ¹⁶	
Size and Type of Building Covered:	Commercial and multi-residential >50,000 ft ² Municipal >10,000 ft ²
Information Disclosure Requirement:	<ul style="list-style-type: none"> • Report energy and water use to government annually • Government makes reported information available on a public web site.
Rating tool used:	ENERGY STAR Portfolio Manager
First compliance period	2009 for municipal buildings 2010 for buildings > 200,000 ft ² 2011 for buildings > 150,000 ft ² 2012 for buildings > 100,000 ft ² 2013 for buildings over 50,000 ft ²
Outcomes to date:	<ul style="list-style-type: none"> • 399 public buildings benchmarked and profiled on public web site. • Government is now engaged in 29 energy and water use reduction projects in public buildings. • Private building energy use data will be posted online in winter 2014.
Interesting aspects of jurisdiction-specific experience:	<ul style="list-style-type: none"> • Phasing in compliance requirements, starting with government initially leading by example, was a successful approach because it demonstrated both the feasibility and the benefits of benchmarking.

Seattle (Legislation passed January 2010) ¹⁷	
Size and Type of Building Covered:	Non-residential and multi-unit residential buildings >20,000 ft ²
Information Disclosure Requirement:	<ul style="list-style-type: none"> • Report energy use to government annually. • Disclose energy use information to current and prospective tenants, prospective buyers and lenders, upon request.
Rating tool used:	ENERGY STAR Portfolio Manager
First compliance period	2011 for buildings >50,000 ft ² 2012 for buildings >20,000 ft ²
Outcomes to date:	<ul style="list-style-type: none"> • 93% compliance rate • Identified the potential for \$55million in annual energy savings if the worst performing 25% of buildings were brought up to national average ENERGY STAR ratings.¹⁸
Interesting aspects of jurisdiction-specific experience:	<ul style="list-style-type: none"> • Building size threshold was initially set at >10,000 ft², but was later raised to >20,000 ft² to better match the City's capacity to implement the policy.¹⁹ • Seattle achieved its policy's high compliance rate through strong outreach efforts to building owners that included technical support, and enforcement.

United Kingdom (UK Regulations passed in 2007) ²⁰	
Legislation passed:	Energy Performance of Buildings Directive passed by European Union in 2002, Energy Performance of Buildings Regulations passed in England & Wales in 2007
Size and Type of Building Covered:	Residential and commercial buildings >50m ² (asset rating) Public buildings >1000m ² (approx. 11,000ft ²) (asset <i>and</i> operational rating)
Information Disclosure Requirement:	<ul style="list-style-type: none"> • Property owners must disclose Energy Performance Certificates (EPCs) to prospective buyers or lessees²¹. • Government stores EPCs in a central registry, which is accessible online²². • Public buildings must place a Display Energy Certificate (an operational rating) in public view inside the building. • Commercial buildings >500m² that are frequently visited by the public must display an EPC if one has been issued.
Rating tool used:	UK Energy Performance Certificate (asset rating) and Display Energy Certificate (operational rating).
First compliance period	April 2008 for commercial buildings >10,000m ² July 2008 for commercial buildings >2,500m ² October 2008 for all remaining commercial buildings >50m ²
Outcomes to date:	As of August 2012: <ul style="list-style-type: none"> • 8.1 million Energy Performance Certificates for residential buildings • 357,000 Energy Performance Certificates for non-residential buildings • 124,000 Display Energy Certificates for public buildings²³
Interesting aspects of jurisdiction-specific experience:	<ul style="list-style-type: none"> • If an EPC exists for a building, the EPC rating must be disclosed in any commercial media advertisements for the sale or renting of the property. • Property owners must make EPCs available to prospective buyers and lessees at the earliest opportunity, at least at the time of providing written information about the building, or when showing the building.

Benefits of Adopting an Energy Reporting Requirement

Community Benefits

Consumer and Investor Protection through Better Access to Building Energy Use Data

When buying a vehicle, consumers can compare the fuel efficiency of various models and incorporate that information into their purchasing decisions. Buying or leasing real estate is a much larger financial commitment than buying a car, but the equivalent access to energy efficiency information does not currently exist in the buildings sector. Energy reporting requirements make information about a building’s energy performance transparent, allowing would-be buyers, lessees and lenders to make decisions based on a price signal that might otherwise be obscured²⁴.

Green Jobs

Increased demand for energy efficiency goods and services translates into local jobs for skilled workers (e.g. to perform energy audits, retro-commissioning, and energy-saving upgrades and retrofits). For example, in 2012, the Political Economy Research Institute and the Institute for Market Transformation did an analysis of job creation and energy cost savings as a result of building energy rating and disclosure policies. They calculated that 15.74 jobs are created for every \$1 million spent on operational improvements, and that around 13 jobs are created for every \$1 million spent on capital upgrades. In addition, they estimated that almost 10 jobs are created for every \$1 million of energy cost savings that are directed to non-energy spending²⁵. A quick calculation using this last number indicates that an ERR policy for large buildings in Toronto could be expected to create approximately 1480 jobs annually by 2020 just from energy savings alone².

CASE STUDY: Affordable Housing		527 12 th Avenue East, Seattle ²⁶
<ul style="list-style-type: none"> ➔ Benchmarking allowed Bellwether Housing to identify poorly performing buildings in its portfolio ➔ An energy audit identified why Mercer Court’s energy costs were high and identified appropriate upgrades ➔ Easy fixes yielded a ✓ 40% reduction in energy use in October and November 2011 compared to 2010 		<p>“For us, benchmarking and making energy-efficiency improvements isn’t just about helping the environment, it is also a good business decision. Our mission is to help families afford more than rent, so the more we can do to lower our energy costs and keep housing affordable, the better.”</p> <p>- Lynda Carey, Construction and Asset Manager at Bellwether</p>

Benefits for Building Owners

Energy Performance Information Informs Investment Decisions

Measuring and annually reporting on building energy use provides building owners and managers with valuable information that can help identify underperforming buildings in a portfolio and prioritize opportunities to invest in improving energy efficiency. For example, a 2012 survey conducted by the trade magazine *Building Operating Management* and Siemens Industry Inc. found that 73% of facility

managers who had benchmarked their facilities had made efforts to improve their facilities' performance as a direct result of their initial scores²⁷. Benchmarking also allows building owners to verify that savings from energy efficiency investments are being realized.

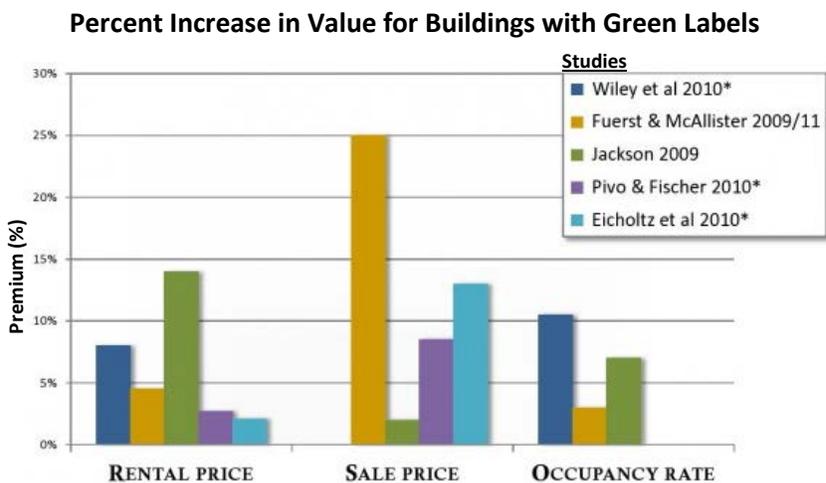
CASE STUDY: Office Space and Retail		One Franklin Square, District of Columbia ²⁸
<ul style="list-style-type: none"> ➔ Regular benchmarking since 1999 showed how much energy was being used and how much was being saved by energy efficiency measures. ➡ Owner looked at hourly energy needs of tenants to help them implement smart operational changes. ✓ Reduced utility charges by 13% in the first three years with no capital changes. 		<p>“As utility rates continued to rise, the cost per square foot for utilities steadily declined due to operational changes and technology upgrades.”</p> <p>- <i>Mark Jensen,</i> <i>Engineering Manager</i></p>

Achieving Cost Savings and Safeguarding Against Energy Cost Increases

Building owners and cities alike are looking for ways to better manage energy costs. According to the EPA in the U.S., energy consumption represents 30% of a typical office building's costs and is a property's single largest operating expense²⁹. Energy prices are also notoriously volatile, which means that reducing energy use not only yields overall energy savings, but could also help offset increases in the price of natural gas and electricity. For example, One Franklin Square in Washington D.C. is a mixed-use building owned by the real estate company Hines. Hines has a company-wide policy requiring energy tracking, and it first benchmarked One Franklin Square in 1999. Since then, the company has continued to make small changes to improve the building's energy performance, raising the building's ENERGY STAR score from an already respectable 77 to an impressive 89. As a result, although utility rates in the D.C. area have increased by 125% over the past 18 years, Hines' tenants at One Franklin Square have only experienced a 19% increase in their utility bills over the same period³⁰.

Marketplace Recognition of Energy Performance

Reporting annually on building energy use is a way of recognizing and rewarding building owners for their investments in energy efficiency. For top performing buildings, participation in an ERR program can also facilitate certification in voluntary green building labelling programs like LEED EB:O&M, BOMA BEST, or ENERGY STAR. Studies show that buildings with green labels benefit



(Adapted from the Institute for Market Transformation)

from higher sale prices, rental rates, and occupancy rates than non- green-labelled buildings³¹. This valuing of energy efficiency is reflected in the results of a 2011 survey of workshop participants in California who had benchmarked their buildings. More than half had used or expected to use their benchmarking activities to market their buildings, and 35% reported that benchmarking had played a role in the acquisition of new buildings by their organization³².

Benefits to the City

Achieving Toronto’s 2020 Greenhouse Gas Reduction Target

The City of Toronto has a target of reducing its GHG emissions by 30% below 1990 levels by 2020, equivalent to approximately 19.1 million tCO_{2e}³³. Roughly half of Toronto’s GHG emissions come from buildings³⁴. Energy efficiency standards in the building code affect the emissions levels in new buildings – Toronto has shown leadership on this front by adopting the Toronto Green Standard³⁵. However, existing buildings represent a much larger source of GHG emissions in Toronto³⁶. Furthermore, even for new buildings built to TGS, building operations and management practices will have major impacts on performance. Implementing an ERR would go a long way toward meeting the city’s GHG reduction targets. If Toronto were to implement an energy reporting requirement for all commercial and multi-residential buildings larger than 50,000ft² starting in 2015, the resulting city-wide reduction in annual GHG emissions in 2020 would be approximately 350,000 tCO_{2e} per year³⁷.

Opportunity to Implement “Conservation First”

An energy reporting requirement for existing buildings aligns perfectly with the Conservation First focus of the province’s updated Long Term Energy Plan. Reducing the overall energy consumption of Toronto’s existing building stock would alleviate pressure on the city’s energy infrastructure and address localized electricity constraints that are inhibiting opportunities for in-fill development.

Improve Conservation Program and Policy Design

An energy reporting requirement would allow the City to develop a database of accurate and comparable data on the energy use of its larger buildings that could be used to analyse patterns of consumption and to identify structures most in need of energy efficiency measures. In this way, ERR results could inform conservation programs and policies so that they provide support to segments of the building sector most in need of improvement.

CASE STUDY: Office Building		5 Penn Plaza, New York City ³⁸
<ul style="list-style-type: none"> ➔ Benchmarking identified high fuel oil and electricity consumption ➔ ASHRAE Level 2 energy audit and retro-commissioning of building systems identified options for improving energy performance ➔ Management implemented lower cost measures ✓ 25% reduction in fuel oil use ✓ 2% reduction in electricity use ✓ ENERGY STAR score 77 (up from 71) 		<p>“Benchmarking our building proved to be highly beneficial as it identified the need for further investigation of our energy usage. Furthermore, the continual benchmarking helped us demonstrate that the implemented energy improvements at the building have resulted in an increase in our ENERGY STAR score.”</p> <p>- Abe Ramadan, Building Manager</p>

Possible Concerns and Solutions

Reputational Damage

Building owners may be concerned that publicly reporting poor energy performance will negatively impact their corporate reputation or the value of their properties.

To address this concern, all of the U.S. cities that have thus far implemented public ERR policies have started public disclosure in the second year of energy use reporting to give owners of poorly-performing buildings the opportunity to improve their buildings' efficiency before energy use reports are made public³⁹. Another approach that has been taken in Austin and Seattle is to require disclosure of energy use reports to prospective buyers, lessees and/or lenders at the time of transaction, rather than to the general public.

Concern about Regulatory Burden

To avoid additional reporting requirements related to their businesses, some building owners may advocate letting buildings track and report energy use on a voluntary rather than mandatory basis (e.g. through participation in labelling programs like LEED EB: O&M, BOMA BEST and ENERGY STAR).

Approaches taken in other jurisdictions to address this concern include involving representatives of the buildings sector in the policy development process so that their concerns and issues are addressed, and providing adequate outreach, education, training and technical supports so that complying with an ERR does not significantly add to building owners' existing regulatory burden.

Time and Effort Required to Comply

Two concerns that have been raised in U.S. jurisdictions are the potential difficulty obtaining whole-building energy use data for sub-metered buildings, and the effort required to input energy use data into reporting tools when the ability to upload energy use data from utilities is not available.

Lessons to emerge from U.S. jurisdictions in this regard include 1) the need to engage utilities early in the ERR policy development process⁴⁰ to work on appropriate solutions for providing building owners with aggregated whole-building data for sub-metered multi-tenant buildings⁴¹, and 2) the need to make data entry and reporting as automated as possible. The EPA's ENERGY STAR Portfolio Manager tool has greatly facilitated energy reporting in U.S. jurisdictions, especially where utilities allow customers to automatically upload their energy use data directly into the tool. Portfolio Manager has recently been adapted for use in Canada by Natural Resources Canada and is available to building owners free of charge⁴².

Privacy Concerns

Tenants in sub-metered buildings may be reticent to provide building owners with utility bill data for fear that it will reveal information about their activities that they do not want disclosed. This type of privacy concern tends to be more of an issue with multi-unit residential buildings than with multi-tenant commercial buildings.

Approaches that may help to alleviate privacy concerns include 1) clearly communicating that suite-level energy use data is never publicly disclosed under ERR programs, only whole-building data, and 2) working with utilities and the privacy commissioner to arrive at data disclosure practices that address privacy concerns.

Cost of Program Implementation

For a city implementing an energy reporting requirement, the costs associated with designing, rolling out, and administering an ERR typically depend on the staff time devoted to each of those activities.

An important factor in the amount of staff time required to implement an ERR policy is whether the policy's building type and size thresholds strike the right balance between effort required and benefit gained⁴³. Once an ERR policy is being rolled out, demands on City staff can often be reduced by working with community partners. In New York City, academic partners and the local green building council chapter played key roles in training and assisting building operators and in analyzing energy use data. Energy service companies also assisted with outreach to building owners. Numerous cities in the U.S. have also made use of external funding opportunities (e.g. grants) to support the design and roll-out of ERR policies⁴⁴.

Overlap with Other Programs

Another concern is whether an ERR would compete with voluntary programs, or duplicate the provincial government's existing requirement under the *Green Energy Act* that municipalities report on energy use and GHG emissions from their corporate facilities⁴⁵.

For top performing buildings, ERRs can facilitate participation in voluntary energy benchmarking and labelling programs. However, such programs tend not to attract the poorest performing buildings (which are most in need of improvement⁴⁶), and the cost of achieving voluntary certifications (which require far more than energy reporting) can also be a barrier for many buildings. Voluntary programs are therefore not expected to have a major impact on city-wide emissions, but continue to play an important role in cities that have adopted ERRs.

Although the *Green Energy Act* requires energy reporting by public agencies, the regulation covers only a modest portion of the buildings that could benefit from an ERR. Nevertheless, several jurisdictions in the U.S. have phased in ERRs by first using public sector buildings to demonstrate the feasibility and benefits of energy reporting before extending requirements to private sector buildings.

The City of Toronto's Powers

The City's authority to adopt and implement an energy reporting requirement for existing buildings has not been clearly established.

In 2009, City Council approved *The Power to Live Green: Toronto's Sustainable Energy Strategy*, which included direction to City staff to take the actions necessary to evaluate and implement an energy benchmarking and labelling program for buildings in Toronto⁴⁷. This directive has yet to be addressed in part because the City's authority to adopt and implement an energy reporting requirement for existing buildings has not been clearly established. However, there is some basis of understanding⁴⁸ and precedent for the City adopting an ERR by-law. For example, Toronto's existing Environmental Reporting and Disclosure by-law requires local facilities to track and annually report on the use and release of 25 priority substances⁴⁹ under the City's ChemTRAC program⁵⁰. Resolution of this issue would be an important first step in any further exploration of the ERR opportunity for Toronto.

Conclusions and Recommendations

Toronto's 2020 Greenhouse Gas Target

Buildings produce over 50% of Toronto's annual GHG emissions, so reducing GHGs from existing buildings is essential to meeting Toronto's GHG emissions target of 30% below 1990 levels by 2020.

Best Practice for Reducing Greenhouse Gas Emissions from Buildings

Energy reporting requirements have met with great success in various jurisdictions in the U.S. and around the world and are now regarded as a best practice for accelerating energy efficiency in buildings.

Existing City Council Direction

The City of Toronto has already directed City staff to evaluate and implement an energy benchmarking program for Toronto's commercial and multi-unit residential building sectors as part of the 2009 *Power to Live Green: Toronto Sustainable Energy Strategy*.

Stakeholder Interest

Multiple stakeholders in Toronto are interested in the possibility of implementing an energy reporting requirement for buildings in the City of Toronto, and TAF received valuable feedback on the topic from a group of stakeholders at the Toronto Atmospheric Fund's 2014 Dan Leckie Forum held on February 21st.

Enabling Technology Available

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Recommendation

For these reasons, the Toronto Atmospheric Fund strongly recommends that the City of Toronto develop an energy reporting requirement for large buildings at the earliest opportunity. Such a policy would help the City reach its 2020 GHG reduction goals, make energy costs transparent to large building owners and users, generate a potential \$172.5 million in energy cost savings¹, and create more than 1480 local jobs².

The Toronto Atmospheric Fund further recommends that any development of an energy reporting requirement should include extensive consultation with relevant stakeholders, including representatives of the following groups:

- Building owners and tenants
- Building operators and managers
- Realtors and property assessors
- Energy service companies
- Utilities like Enbridge and Toronto Hydro
- IT professionals
- Natural Resources Canada
- Relevant divisions of the City of Toronto (e.g. Environment & Energy, Buildings, Facilities, Economic Development), and
- Relevant provincial government Ministries and agencies (e.g. Ministry of Energy, Ministry of Municipal Affairs and Housing, the Ontario Energy Board, and the Privacy Commissioner).

Endnotes

- ¹ The figure of **\$172.5 million in annual energy savings** is based on the following assumptions and calculations:
- 1) ERR applies to all commercial and multi-residential buildings over 50,000 square feet,
 - 2) Compliance levels match New York City's experience of 74% compliance by floor area (New York City, 2013, *New York City Local Law 84 Benchmarking Report: September 2013*, p. 36, http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/ll84_year_two_report.pdf).
 - 3) Buildings that comply with ERR experience a 2.4% annual reduction in energy use, as has been observed among buildings benchmarked in the EPA's ENERGY STAR Portfolio Manager (Environmental Protection Agency, 2012, *ENERGY STAR Portfolio Manager Data Trends: Benchmarking and Energy Savings*, p.1, http://www.energystar.gov/buildings/sites/default/uploads/tools/DataTrends_Savings_20121002.pdf?e969-5b60).
 - 4) 2.4% savings translates into annual natural gas and electricity use reductions of 169,616,506m³ and 1,147,966,376kWh, respectively, by 2020.
 - 5) Natural gas costs \$0.38/m³ and electricity costs \$0.10/kWh by 2020 (assuming 2% inflation based on today's OEB utility rates, a conservative estimate).
- ² The figure of **1481 jobs per year by 2020** represents the estimated number of jobs that would be induced by spending energy cost savings in the wider economy rather than on energy (i.e. this figure does not capture the additional job creation that could be expected from building owners making capital upgrades and operational improvements in order to increase the efficiency of their buildings). The figure of 1481 annual induced jobs is arrived at by multiplying the Institute for Market Transformation's energy savings job creation factors by the \$172.5 million in annual energy savings (\$41,599,230 for multi-unit residential and \$130,886,914 for commercial buildings) that could be expected from an ERR policy in Toronto by 2020. (See table below for factors).

Table 6: Employment Estimates per \$1 million, Energy Savings

Jobs supported by energy spending	Direct jobs per \$1 million	Indirect jobs per \$1 million	Induced jobs per \$1 million	Total jobs per \$1 million
Multifamily	1.20	2.60	1.52	5.32
Commercial	1.30	2.50	1.52	5.32
Jobs created through consumption of non-energy goods by building owners and tenants	Direct jobs per \$1 million	Indirect jobs per \$1 million	Induced jobs per \$1 million	Total jobs per \$1 million
Multifamily				
Owners - High-income individuals (70%)	7.50	3.50	4.40	15.40
Owners - Real estate firms (30%)	7.20	3.60	4.32	15.12
Tenants	7.00	3.60	4.24	14.84
Total (75% owner/25% tenant split)	7.31	3.55	4.34	15.20
Commercial				
Owners – Real estate firms	7.20	3.60	4.32	15.12
Tenants – Various types (see below)	7.00	3.50	4.20	14.70
Total (75% owner/25% tenant split)	7.15	3.58	4.29	15.02
Net difference in jobs by shifting from energy spending to non-energy spending (jobs created through energy savings)	Direct jobs per \$1 million	Indirect jobs per \$1 million	Induced jobs per \$1 million	Total jobs per \$1 million
Multifamily	6.11	0.95	2.82	9.88
Commercial	5.85	1.08	2.77	9.70

(Institute for Market Transformation & Political Economy Research Institute, 2012, *Analysis of Job Creation and Energy Cost Savings from Building Energy Rating and Disclosure Policy*, p.12, http://www.imt.org/uploads/resources/files/Analysis_Job_Creation.pdf)

- ³ Depending on the policy, buildings may be rated based on their actual energy use (called operational rating), or using estimates of likely energy use based on building characteristics (called asset rating).

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- ⁴ ERRs can be distinguished from existing building rating, benchmarking and labelling systems like LEED EB:O&M and BOMA Best in that an ERR makes reporting building energy use mandatory for the entire subset of buildings to which the policy applies whereas programs like LEED EB:O&M and BOMA Best are voluntary and tend to attract only the best-performing buildings as participants.
- ⁵ Energy includes electricity, natural gas, fuel oil and propane. Energy use reports are often also required to include information about water use.
- ⁶ Some policies also require disclosure to current tenants. Policies can, and do, vary in whether they include one, all, or a combination of these mandatory disclosure options. For a summary of disclosure requirements in U.S. cities that have passed building energy reporting requirements, see the Institute for Market Transformation's summary chart of energy reporting requirement policies in U.S. jurisdictions at http://www.imt.org/uploads/resources/files/Commercial_Benchmarking_Policy_Matrix_9_13.pdf.
- ⁷ The appropriate level at which to set building size thresholds will depend on the nature of the existing building stock in the jurisdiction where the ERR policy will be implemented.
- ⁸ The standard metric for measuring building energy performance is energy use intensity (EUI). EUI is calculated by dividing the total energy consumed by a building in a year by that building's total floor space, and is expressed in units of GJ/m² (<http://www.nrcan.gc.ca/energy/efficiency/buildings/energy-benchmarking/3721>)
- ⁹ Institute for Market Transformation, 2013, *Utilities' Guide to Data Access*, p. 2, http://www.eebhub.org/media/files/IMT_Report_-_Utilities_Guide_-_March_2013.pdf
- ¹⁰ Benchmarking is defined as "a process that either compares the energy use of a building or group of buildings with other similar structures or looks at how energy use varies from a baseline" (ENERGY STAR, 2008 qtd. In ACEEE, 2012, *Commercial Building Benchmarking: Will They Manage It Once They've Measured It?*, <http://www.aceee.org/files/proceedings/2012/data/papers/0193-000118.pdf>).
- ¹¹ Environmental Protection Agency, 2012, *ENERGY STAR Portfolio Manager Data Trends: Benchmarking and Energy Savings*, p.1, http://www.energystar.gov/buildings/sites/default/uploads/tools/DataTrends_Savings_20121002.pdf?e969-5b60
- ¹² ACEEE, 2012, *Commercial Building Benchmarking: Will They Manage It Once They've Measured It?*, p. 368-369, <http://www.aceee.org/files/proceedings/2012/data/papers/0193-000118.pdf>
- ¹³ New York City, 2013, *New York City Local Law 84 Benchmarking Report: September 2013*, pp. 12, 37, http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/ll84_year_two_report.pdf. (Also, personal communication with Caroline Keicher of the Institute for Market Transformation, Jan. 14, 2014).
- ¹⁴ For more information on NYC's Greener, Greater Buildings Plan, see <http://www.nyc.gov/html/gbee/html/plan/plan.shtml>
- ¹⁵ Green Cities California, 2012, *ENERGY BEST PRACTICE: Commercial Building Energy Efficiency, San Francisco, CA*, http://greencitiescalifornia.org/best-practices/energy/SF_commercial-building-energy-efficiency.html
- ¹⁶ District of Columbia, 2008, *Clean and Affordable Energy Act, 2008, Title V: Energy Benchmarking Requirements for Private and Government Buildings*, pp. 17-18, http://ddoe.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/CAEA_of_2008_B17-0492.pdf
- ¹⁷ City of Seattle Legislative Information Service, 2010, *Ordinance Number 123226*, <http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?s1=&s3=116731&s4=&s2=&s5=&Sect4=AND&l=20&Sect2=THESON&Sect3=PLURON&Sect5=CBORY&Sect6=HITOFF&d=ORDF&p=1&u=/~public/cbory.htm&r=1&f=G>
- ¹⁸ City of Seattle Office of Sustainability and Environment, 2014, *2011/2012 Seattle Building Energy Benchmarking Analysis Report*, p. 3-4, <http://www.seattle.gov/Documents/Departments/OSE/EBR-2011-2012-report.pdf>
- ¹⁹ City of Seattle Legislative Information Service, 2012, *Ordinance Number 123993*, <http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?s1=&s3=&s4=123993&s2=&s5=&Sect4=AND&l=20&Sect2=THESON&Sect3=PLURON&Sect5=CBORY&Sect6=HITOFF&d=ORDF&p=1&u=/~public/cbory.htm&r=1&f=G>
- ²⁰ Legislation.gov.uk, *The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007*, <http://www.legislation.gov.uk/uksi/2007/991/contents/made> (**Note:** UK regulations transposed a 2002 European Union Energy Performance of Buildings Directive into a national law).

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- ²¹ EPCs must be disclosed to potential buyers and lessees at the earliest opportunity – at the very least, earlier than a) the time of providing the prospective buyer or lessee with any information about the property in writing, or b) at the time the prospective buyer or lessee views the property. If an EPC already exists for a building, the EPC rating must be included in any commercial advertisements for the property. (Legislation.gov.uk, *The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007*, <http://www.legislation.gov.uk/uksi/2007/991/part/2/made>)
- ²² Landmark Information Group, n.d., *EPC Registers*, <http://www.epcregister.com/>
- ²³ Department for Communities and Local Government, 2012, *Impact Assessment (IA): Recast of the Energy Performance of Buildings Regulations*, p. 3, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/39379/Impact_Assessment.pdf
- ²⁴ If markets function best when all participants have as close as possible to perfect information, then providing prospective buyers, lessees or lenders with additional information upon which to base their purchase, leasing or lending decisions should help to improve the functioning of real estate markets.
- ²⁵ Institute for Market Transformation & Political Economy Research Institute, 2012, *Analysis of Job Creation and Energy Cost Savings from Building Energy Rating and Disclosure Policy*, pp.11-12, http://www.imt.org/uploads/resources/files/Analysis_Job_Creation.pdf
To cite another example, NYC’s Greener Greater Buildings Plan (which includes LL84 – an energy benchmarking policy for buildings over 50,000 ft², as well as subsequent legislation requiring energy audits, retro-commissioning, and lighting upgrades) is expected to create or preserve 17,800 local skilled jobs by 2030 (New York City, 2013, *New York City Local Law 84 Benchmarking Report: September 2013*, p. 8, http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/ll84_year_two_report.pdf)
- ²⁶ City of Seattle, 2014, *Benchmarking: Unlocking Energy Savings in Residential Buildings*, <http://www.seattle.gov/documents/departments/ose/ebr-mercerc.pdf>
- ²⁷ Building Operating Management & Siemens Industry Inc., 2012, *Measurement and Monitoring Can Improve Energy Efficiency*, p. 4, <http://www.facilitiesnet.com/reach4fms/pdfs/EnergyServices61912Press.pdf>
- ²⁸ District of Columbia, 2013, *Benchmarking: Capital Gains, One Franklin Square, Washington DC*, http://www.imt.org/uploads/general/OneFranklinSq_CS-final.pdf
- ²⁹ Environmental Protection Agency, 2013, *Energy Efficiency in Non-Governmental Buildings*, <http://www.epa.gov/statelocalclimate/local/topics/commercial-industrial.html>
- ³⁰ District of Columbia, 2013, *Benchmarking: Capital Gains, One Franklin Square, Washington DC*, http://www.imt.org/uploads/general/OneFranklinSq_CS-final.pdf
- ³¹ For summaries of relevant studies on the impact of eco-labels on rental rates and capital value, see this Real Estate Appraisal web page compiled by academics from the University College London and the University of Reading: http://pjwrep.x10.mx/wp/?page_id=268 .
For visual representations of the premiums involved, see the Institute for Market Transformation’s charts on sale prices (http://www.imt.org/uploads/resources/files/2Added_Value_of_Greener_Buildings_-_Sale_Price.pdf), rental rates (http://www.imt.org/uploads/resources/files/3Added_Value_of_Greener_Buildings_-_Rental_Price.pdf), and occupancy rates (http://www.imt.org/uploads/resources/files/2Added_Value_of_Greener_Buildings_-_Sale_Price.pdf)
The figure to the right is adapted from the Institute for Market Transformation, n.d., *Energy Efficiency and Property Value*, <http://www.imt.org/policy/efficiency-and-value>
- ³² ACEEE, 2012, *Commercial Building Benchmarking: Will They Manage It Once They’ve Measured It?*, p. 368, <http://www.aceee.org/files/proceedings/2012/data/papers/0193-000118.pdf>
- ³³ Toronto’s total GHG emissions were 27,330,082 tCO_{2e} in 1990 (City of Toronto Staff, March 2013, *Summary of Toronto’s 2011 Greenhouse Gas and Air Quality Pollutant Emissions Inventory*, p. 5). Therefore, at 30% below 1990 levels, Toronto’s 2020 target is 19,131,057 tCO_{2e}.
- ³⁴ Toronto Atmospheric Fund (2010). *Unleashing the Power of Efficiency: TAF Strategic Plan*, p. 3.
Toronto Atmospheric Fund (2013). *Raising the Bar: Updating the Energy Efficiency requirements in Toronto’s Green Standard for New Construction*, p. 3, <http://www.toronto.ca/legdocs/mmis/2013/ta/bgrd/backgroundfile-58487.pdf>

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- ³⁵ City of Toronto, 2014, *Toronto Green Standard*, <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=f85552cc66061410VgnVCM10000071d60f89RCRD>
- ³⁶ For example, research under Toronto's Tower Renewal program indicates that deep retrofits to Toronto's existing concrete apartment towers (e.g. building envelop cladding and high efficiency heating systems) could reduce those buildings' utility use by 50%, which would cause a 5% reduction in overall city GHG emissions (City of Toronto, 2013, *Next 10 Years of Tower Renewal: Achieving city-wide improvement*, p. 1, <http://www1.toronto.ca/City%20Of%20Toronto/Social%20Development,%20Finance%20&%20Administration/S%20hared%20Content/Tower%20Renewal/PDFs/trtenyearstrategy.pdf>)
- ³⁷ The figure of 350,000 tonnes per year in 2020 is based on the following assumptions: 1) ERR applies to all commercial and multi-residential buildings over 50,000 square feet, 2) Compliance levels match New York City's experience of 74% compliance by floor area (New York City, 2013, *New York City Local Law 84 Benchmarking Report: September 2013*, p. 36, http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/ll84_year_two_report.pdf). Buildings that comply with ERR experience a 2.4% annual reduction in energy use, as has been observed among buildings benchmarked in the EPA's ENERGY STAR Portfolio Manager (Environmental Protection Agency, 2012, *ENERGY STAR Portfolio Manager Data Trends: Benchmarking and Energy Savings*, p.1, http://www.energystar.gov/buildings/sites/default/uploads/tools/DataTrends_Savings_20121002.pdf?e969-5b60).
- ³⁸ New York City, 2013, *New York City Local Law 84 Benchmarking Report: September 2013*, p. 26, http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/ll84_year_two_report.pdf
- ³⁹ If results are to be disclosed publically, a city may also elect to create a website for displaying the energy use results of compliant buildings (as in the case of D.C.: <http://www.buildsmartdc.com/>), or may simply allow the public to download building energy use data from the City's existing website in spreadsheet format (as is the case in New York City: http://www.nyc.gov/html/gbee/html/plan/ll84_scores.shtml).
- ⁴⁰ Northeast Energy Efficiency Partnerships (NEEP) & Dunsky Energy Consulting, 2013, *Building Energy Rating and Disclosure Policies Update and Lessons From the Field*, p. 20, http://www.neep.org/Assets/uploads/files/public-policy/building-energy-rating/BER%20Supplement_FINAL%20DRAFT_2-25-13.pdf
- ⁴¹ For example, many U.S. utilities do not require the consent of tenants to provide whole-building aggregated energy use data to building owners if a building has more than 3-5 customer accounts (Institute for Market Transformation, 2013, *Utilities' Guide to Data Access*, p. 17, http://www.eebhub.org/media/files/IMT_Report_-_Utilities_Guide_-_March_2013.pdf).
- ⁴² The EPA's Energy STAR Portfolio Manager tool has been used to benchmark nearly 40% of the U.S. commercial buildings market (NRCAN, 2014, *All about ENERGY STAR Portfolio Manager*, <http://www.nrcan.gc.ca/energy/efficiency/buildings/energy-benchmarking/3733>)
- ⁴³ In setting thresholds, an appropriate balance must be struck between effort expended and benefit gained. One lesson learned by Seattle in the development of its energy benchmarking policy was that requiring smaller buildings to measure and report on their energy use yields diminishing returns. Smaller buildings require more outreach and engagement to achieve compliance, but they typically represent a smaller share of GHG emissions than larger buildings. Therefore, although Seattle initially set its building size threshold at 10,000 square feet, it later increased the threshold to 20,000 square feet in recognition that the additional GHG savings that would result from bringing the smaller buildings into compliance did not merit the additional level of effort required to do so (Personal communication with Caroline Keicher of IMT, Jan. 14, 2014, and Rebecca Baker of the City of Seattle, Feb. 6, 2014).
- ⁴⁴ Many U.S. cities received grants to assist with the start-up of energy reporting requirements (Personal Communication with Caroline Keicher, IMT, Jan. 14, 2014). For example, the City of Seattle was able to cover 100% of the costs of rolling out its ERR policy using grants, and is now transitioning to funding the administration of the ERR policy through City program funding (Personal Communication with Rebecca Baker, City of Seattle, Feb. 5, 2014).
- ⁴⁵ Ontario Regulation. 397/11
- ⁴⁶ For example, an EPA study of 35,000 benchmarked buildings in the United States found that buildings that started with lower than average energy efficiency actually achieved twice the reduction in energy use over a

three year period as buildings that started with above average energy efficiency (Environmental Protection Agency, 2012, *ENERGY STAR Portfolio Manager Data Trends: Benchmarking and Energy Savings*, p.1, http://www.energystar.gov/buildings/sites/default/uploads/tools/DataTrends_Savings_20121002.pdf?e969-5b60)

⁴⁷ In 2009, Toronto City Council approved *The Power to Live Green: Toronto's Sustainable Energy Strategy*, which included direction to City staff to “undertake the actions necessary in 2010 for the City to evaluate and implement a building energy benchmarking and energy use labelling program, initially for institutional buildings and subsequently for commercial/multi-unit and residential buildings” (Toronto City Council, 2009, *City Council consideration on November 30, 2009: The Power to Live Green: Toronto's Sustainable Energy Strategy*, s. 3.f, <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2009.EX36.9>).

Under the same the Sustainable Energy Strategy, Council also directed the City Manager to work with province to amend provincial laws to require energy audits and disclosure of energy consumption of buildings at point of sale (with the intent that the province should fund the required energy audits), and if necessary, to pursue alternative, local measures as permitted under the City of Toronto Act (Toronto City Council, 2009, *City Council consideration on November 30, 2009: The Power to Live Green: Toronto's Sustainable Energy Strategy*, s. 10.a.iii, <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2009.EX36.9>).

⁴⁸ Under section 8 of the *City of Toronto Act*, the City has the power to provide any service or thing that the City considers necessary or desirable for the public (*City of Toronto Act*, 2006, s. 8). The City also has the ability to make by-laws respecting the economic, social and environmental well-being of the City (*City of Toronto Act*, 2006, s. 8.(2)5), by-laws respecting structures (including fences and signs) (*City of Toronto Act*, 2006, s. 8.(2)10), and by-laws requiring persons to do things (*City of Toronto Act*, 2006, s. 8(3)).

⁴⁹ City of Toronto Municipal Code, chapter 423, *Environmental Reporting And Disclosure*, http://www.toronto.ca/legdocs/municode/1184_423.pdf

⁵⁰ City of Toronto, 2014, *ChemTRAC*, <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=8e00ebfc2bb31410VgnVCM10000071d60f89RCRD>