

Covering Memo

To: Juliette Butler

From: Shadman Sadab Sayeed

Date: 10/8/2020

Subject: Prevention of Carbon Emissions from 250 Yonge Street Building, Toronto, Ontario, Canada "Environmental Engineering Technical Report Proposal (ETR591)"

This memo aims to request your approval for my topic proposal titled **Prevention of Carbon Emissions from 250 Yonge Street Building, Toronto, Canada**, which I have attached [for your reference below](#).

The proposal is a research-based discussion that proposes reducing carbon emissions in 250 Yonge Street building in Toronto. The topic was developed out of the concerns that have been raised in Toronto city due to the increased emission of greenhouse gases that have been causing adverse impacts on the environment.

Most of the city buildings have been built in a way that emissions will continue to be experienced for many decades. However, Canada is trying to develop solutions to ensure that the emission of carbon from buildings is prevented. Among the buildings that have been spotted to have increased carbon emissions is 250 Yonge street building, a 35-storey building located in Toronto ON M5B2L7. The building was constructed in 1991; however, greenhouse gas emissions, including carbon, are still high. This means there is a need to establish interventions that will ensure that emission is prevented. This topic is significant as it provides insight into the gaps in the environmental engineering field that needs to be filled. Dakwale & Ralegaonkar (2011) stated that the emission of gases such as carbon results from increased construction energy consumption, which later leads to emissions. The evaluation of gaseous emission from the site provides insight into the solutions that can be provided to ensure that the building is prevented from emitting carbon to the ecosystem. During a building's lifecycle, the operational energy amenities like appliances, equipment, lighting and heating, ventilation, and air conditioning (HVAC) enhance energy consumption in the building by 80% (Huang et al., 2017). Embodied energy is confiscated in the materials during the construction process, while operation energy enhances the environment's maintenance via various processes such as cooling, heating, ventilation, and lighting. Therefore, looking at the report provided from the site, there is the need to develop solutions that will ensure that operational energy is well controlled, and emission is prevented.

Researchers suggest that greenhouse gases have been significant in enhancing climate and make the globe habitable for all the species. However, when these gases are out of control due to their excess quantity, it leads to threats for species' survival. One of the impacts of carbon emission from the site is the increase in sweltering temperature. The management of the site stated in their report that occupants have been complaining of hot temperatures, which they suggested to be caused by the emission of carbon from the building (250 Yonge Street, Toronto Greenhouse Gas Inventory Report, 2013). Around the site there have been cases of thunderstorms that have been influenced by tropical storms. These effects have been suggested to influence carbon emissions that have been on the rise in the location. This report will provide insight into some of the problems faced in the site due to carbon emissions. More so, recommendations for solutions will be provided based on scholars'

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research in the environmental engineering field. However, this report will not provide implementation executions as it will only give recommendations.

The report will be very significant in helping me to complete my ETR591 Course. It will also provide the basis for technical writing in the future. However, failing to develop this report will affect my completion of the ETR591 Course, and my technical writing will be jeopardized in the future.

I affirm that I will submit 100% original work through the signature provided below, and any external source used will be cited effectively. I understand and agree to adhere to honesty without plagiarism and cheating and any institution's penalty.

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STUDENT 

DATE 10/8/2020

PROFESSOR _____

DATE _____

ETR591 **NGG**

Topic Proposal

Title: Prevention of Carbon Emissions from 250 Yonge Street Building, Toronto, Ontario, Canada

1.0 Introduction

Buildings and the construction process contribute approximately 36% of the global energy consumption and 39% of energy-related carbon emissions (Dakwale & Ralegaonkar, 2011). Global emissions from the buildings are linked to two processes:

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Operational carbon from day to day use of energy, heating, and lighting. Operational energy contributes to 28% of the total emissions per year (Dakwale & Ralegaonkar, 2011). The energy produced in the construction process through materials, construction processes, and transportation, influences greenhouse gas emissions. Therefore, there is a need for prevention of the emissions that are produced by buildings. Accounting the carbon emission footprint from buildings will ensure that the environmental engineering field is enhancing the environment (Huang et al., 2017). Understanding the carbon emission from the building will ensure that solutions are developed and executed to protect the environment.

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The presence of urbanization in different countries has contributed to an increased rate of greenhouse emissions from buildings. These emissions are linked to various impacts that affect the habitat of species around the globe. One of the major impacts is increased global warming effect. The ecosystem is not effective in regulating heat as the ozone layer is affected. Also, the rise in tropical storms and floods has been influenced by greenhouse gas emissions (Huang et al., 2017). The solutions recommended to these challenges are enhancing energy consumption in buildings to ensure that emission is regulated through lighting, cooling, heating, and ventilation.

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Please introduce your Site and location here. Follow it by "herein referred to as the Site".

Remember, part of your intro is to introduce your Site and its location so you can refer to it as the Site for the rest of the report. Look at the second lecture for proper wording.

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1.1 Background

Please talk about your site here and info about the building layout and emissions.

In Canada, there have been concerns raised linked to carbon emissions from buildings, which has contributed to environmental impacts. Toronto has been mentioned as the city leading in the emission of carbon from buildings as it accounts for more than 50% of the total emissions (Mohareb & Mohareb, 2014). This has affected 2030 of Canada's vision in achieving zero emissions since most of the old buildings have been emitting carbon since they were constructed. 250 Yonge street building is among the sites that have been presented to contribute to emissions. The building is a 35-storey building located in Toronto ON M5B2L7 (250 Yonge Street, Toronto Greenhouse Gas Inventory Report, 2013). The Site was constructed in 1991; however, it is still linked to increased greenhouse gas emissions, including carbon.

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1.2 Purpose

This report aims to provide insight into the emission of carbon that has been suggested to have adverse impacts on the residence of 250 Yonge street building. Understanding the factors that influence the emission of gases in the building will influence recommendations for possible solutions. As researchers have revealed, there is a need for action in Canada for all environmental engineers to ensure that they minimize greenhouse gas emissions despite the urbanization of buildings. Being one of Toronto's buildings where emissions are high, the 250 Yonge street building needs to be evaluated. When the factors influencing the increased rates of emissions are presented and solutions recommended, it will influence the adoption of evidence-based strategies to enhance the prevention of environmental pollution from other buildings. Therefore, despite this study's specification on the Site, the development of prevention strategies for the emission of gases will be enhanced in the whole country based on evidence-based practice provided in this report.

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2.0 Problem

The major issue raised in Canada is the increased rate of environmental pollution from buildings in various locations. The government developed objectives to ensure decreased greenhouse gas emissions from the buildings to zero levels by 2030. However, researchers show that emissions are still high, which is an obstacle to achieving the 2030 objective.

Toronto, the largest city in Canada, accounts for more than 50% of the total emissions of greenhouse gases from edifices and the environmental engineering experts provides that there are no other safe options that could be adopted in building structure especially in this era of urbanization (Mohareb & Mohareb, 2014). However, the administration still insists that by 2030 the goal of zero emissions must be achieved. Looking at the structures developed in Toronto, the expulsion of carbon and other greenhouse gases will continue for many decades; therefore, there is a need for developing strategies that will ensure solutions to the challenge. The Site is one of the known buildings that emit carbon. The building's administration has been working to find out the solution to the challenge following complaints from different stakes (250 Yonge Street, Toronto Greenhouse Gas Inventory Report, 2013).

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3.0 Scope

The scope of this report will evaluate the Site conditions related to carbon emissions and the target provided by 2030. Solutions to mitigate the carbon emissions will be presented and evaluated in cost, efficiency, and carbon reduction.

This report will incorporate industry best practices employed for retrofitting an existing building to increase the efficiency of its building envelope.

Costs associated with this report will be based on material only and not labour.

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is report explores the factors that enhance the emission of gases from the site and provide solutions that will be developed to ensure that the prevention of environmental pollution is enhanced. The study explores the site through observation and accessing information from the stakes of the building. This involves gaining understating of how the building was constructed and the strategies that are used to control operational energy. The study only concentrates on the Site from 10 am to 12 pm.

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The study covers the issue of carbon emissions from the site. Investigation of the building design and elements contributing to the emission of carbon will be carried out to assess how factors such as ventilation, lighting, cooling, and heating are regulated. The report provides recommendations for solutions based on scholars who are experts in the environmental engineering field. The report only suggests solutions based on research and not opinion.

4.0 Potential Solutions

Various solutions are evidenced-based, which can help the administration of the site in preventing carbon emissions. One of the solutions proposed by researchers in the prevention of carbon emissions from buildings is HVAC strategies. Dakwale & Ralegaonkar (2011) stated that the system enhances a system that regulates cooling and heating periodically to prevent emission by up to 40% (Hertwich et al., 2019). Also, enhancing insulation on the surfaces of the building is significant to prevent emissions. For the building to ensure that energy efficiency is managed, insulation is a significant solution. The use of insulation will ensure that the site saves energy, and the emission of carbon is reduced. More so, water consumption is a process that will enhance the prevention of carbon emission from the Site. Conserving and reusing water decreases the rate of carbon emission. Water efficiency will ensure that energy is saved in the site. This is because of the process of treatment, collection, and distribution of water that releases a high carbon (Hertwich et al., 2019). Therefore, when water is reused, energy conservation will be done, leading to decreased carbon emissions. Other strategies which enhance energy saving which will lead to decreased carbon emission include:

- Control of heat- to ensure that the energy from the heat in the site is not emitted into the atmosphere.
- Control of light- light energy will also ensure that carbon energy from electricity is not released into the environment.
- Enhancing insulation- ventilation prevents the energy generated at the site from being released to the environment.
- Using renewable energy such as solar- renewable sources of energy enhance low control of emission of carbon as the amount of energy produced is low.

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5.0 Evaluation of Solutions

The evaluation of solutions will be based on the assessment procedure carried out in the site. The recommended solutions are set for the management of the site to embrace. However, the site will also be assessed for continuous strategies that have been used to prevent carbon emissions. Observations of the building on the interventions that have been carried out will be used to check if the recommended solutions have been implemented. The change of solutions will be addressed to determine if there are those recently embraced solutions to solve the issue of carbon emissions.

- Control of heat- will be evaluated through enquiring from the administration about their strategies of how heat is regulated.
- Control of lighting will also be assessed by analyzing how the administrations have put strategies to regulate light.
- Insulation- observation of insulation will be observed from the structure of the site.
- Using a renewable energy source will be established by assessing the source of energy used at the Site.

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6.0 Problem Based Methodology

The use of evidence-based solutions will be enhanced through research recommendations from environmental engineering professionals. The problem-based methodology is a technique that will ensure that the problems that are presented at the site are addressed with specificity. This will be enhanced by collecting data regarding the use of HVAC in the prevention of carbon emission at the site. The data about the use of insulation will be accessed from the house owner. The information on strategies such as recycling of water will ensure that the strategies for conservation of energy are done to prevent the emission of carbon from the Site.

7.0 Proposal Format of Report

1.0 Introduction

1.1 Background

1.2 Purpose

2.0 Problem

3.0 Scope

4.0 4.0 Current Site Conditions

5.0 4.1 Site Location

6.0 4.2 Current carbon calculation

3.07.0 4.3 Best Practices

5.0 Potential solutions

4.0 5.1 list each solution as sub-section same as section below.

6.0 Evaluation of Solutions

5.07.0 Selected Solution

6.0 Problem Based Methodology

5.0 Proposal format of the report

8.0 Results

7.09.0 Conclusion

8.010.0 References

8.0 Conclusion

The expected result from the site in this study is that there is poor performance in the strategies that can prevent carbon emissions. Research has suggested that using strategies including HVAC, reusing of water, and using renewable sources of energy prevents increased carbon emissions from buildings. This means that using these strategies in the Site might be absent, or they are done poorly. If the site uses these strategies, the carbon emission could be diminished. Therefore, the expected outcome is that the management of the site does not control operational energy effectively.

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Overall comment –

Your writing is good and is properly referenced.

Your scope needs to outline what the report will do. It is not clear as to what the report will do and reads as a literary report. Please book an appointment with me to discuss the scope.

9.0 References

250 Yonge Street, Toronto Greenhouse Gas Inventory Report. (2013). Retrieved 7 October 2020, from https://www.csaregistries.ca/files/projects/2301-2780_GHGReport_20110401_201203311.pdf.

- Dakwale, V., & Ralegaonkar, R. (2011). Review of carbon emission through buildings: threats, causes, and solutions: Table 1. *International Journal of Low-Carbon Technologies*, 7(2), 143-148. <https://doi.org/10.1093/ijlct/ctr032>
- Hertwich, E., Ali, S., Ciacci, L., Fishman, T., Heeren, N., & Masanet, E. et al. (2019). Material efficiency strategies reduce greenhouse gas emissions associated with buildings, vehicles, and electronics—a review. *Environmental Research Letters*, 14(4), 043004. <https://doi.org/10.1088/1748-9326/ab0fe3>
- Huang, W., Li, F., Cui, S., Li, F., Huang, L., & Lin, J. (2017). Carbon Footprint and Carbon Emission Reduction of Urban Buildings: A Case in Xiamen City, China. *Procedia Engineering*, 198, 1007-1017. <https://doi.org/10.1016/j.proeng.2017.07.146>
- Mohareb, E., & Mohareb, A. (2014). A comparison of greenhouse gas emissions in the residential sector of major Canadian cities. *Canadian Journal of Civil Engineering*, 41(4), 285-293. <https://doi.org/10.1139/cjce-2013-0465>