

# Phase C: Strategic Visioning Workshop – March 2021

## Renewable Energy Generation Strategy – Corporate

The Town of Oakville  
September 2021

## Contents

Introduction .....	2
Workshop Attendees .....	3
The Town of Oakville.....	3
Blackstone Energy Services.....	3
Workshop Synopsis.....	4
Co-benefits of RE Generation .....	5
Social Cost of Carbon .....	5
The Town’s Targets & Efforts to Date.....	6
Renewables Energy in Municipalities .....	6
Renewable Energy Technologies Discussion .....	7
Mural Voting Activity & Discussion.....	9
Closing Comments .....	10
Appendix 1: Questions & Answers.....	11
Renewable Energy in Municipalities.....	11
Renewable Energy Technologies Discussion .....	11
Mural Voting Activity & Discussion.....	13
Email Feedback Received.....	14

## Introduction

The Town of Oakville (“The Town”) engaged Blackstone Energy Services (“Blackstone”) to develop their Renewable Energy (RE) Generation Strategy for their corporate portfolio of buildings in the Fall of 2020. As part of this process, Blackstone held the Strategic Visioning Workshop (“Workshop”) as a step toward realizing that strategy. This report serves as a summary for the events of the day.

The Workshop was held via Microsoft Teams Video Conference on Monday March 1, 2021 from 2:00 PM to 5:00 PM. The Workshop involved attendees from various departments from The Town as well as representatives from Blackstone.

The Workshop focused on informing The Town’s stakeholders of the various Renewable Energy (RE) technologies studied and evaluated as part of the RE generation strategy, and the role RE technologies could play in realizing Oakville’s vision to become “the most livable Town in Canada”.

The Town of Oakville announced a climate emergency in June 2019. The Town also set short- and long-term goals to reduce corporate greenhouse gas (GHG) emissions by 30% from 2014<sup>1</sup> levels by 2030, and by 80% from 2014 levels by 2050. The Town has finalized various community-wide plans to foster climate action with corporate and community points of view. This Strategic Visioning Workshop (“Workshop”) is a step toward realizing The Town’s GHG reduction goals.

The Workshop aimed at shaping the future of RE generation at The Town. The engagement from key staff and stakeholders from The Town has ensured that Blackstone creates an RE generation strategy that supports the goal of making Oakville “the most livable Town in Canada”.

The purpose of the Workshop was to inform The Town’s Stakeholders of the findings and facts to support the development of The Town’s RE Strategy and prioritize them based on collaborative discussions. This would help The Town address their “climate emergency” commitment and help to guide a plan and agenda for climate action.

The objectives for the Workshop were:

- To increase awareness & confidence in Renewable Energy (RE) Technologies
- To assess internal vision & direction for RE at The Town of Oakville
- To understand stakeholder views & priorities for RE projects
- To evaluate strengths, weaknesses, opportunities & threats (SWOT) for RE technologies
- To identify barriers for success
- To gain consensus to guide final strategy report

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<sup>1</sup> A recommendation to change the baseline year to 2015 has been proposed to remove the impact of the Ontario grid turning off coal fired generation in 2014.

## Workshop Attendees

### The Town of Oakville

*Table 1: Attendees from The Town*

Dave Cano	Energy Solutions Manager (Facilities & Construction Management)
Nancy Sully	Commissioner, Corporate Services and Treasurer
Nick Valerio	Manager – Capital Projects (Facilities and Construction Management)
Rob Cameron	Manager – Facilities Operations (Facilities and Construction Management)
Julie Mitchell	Director – Recreation and Culture (Recreation and Culture)
Brent Copeland	Action Senior Manager Operations (Recreation and Culture)
Donna Hales	Manager – Climate Action (Climate Action)
Janis Olbina	Manager – Parks Planning and Development (Parks and Open Space)
Tom Mulvale	Acting Manager – Parks Operations (Parks and Open Space)
Joanne Phoenix	Manager – Fleet & Accessible Services (Oakville Transit)
GianCarlo Mirolla	Supervisor – Maintenance (Oakville Transit)
Alex Stinson	Project Leader – Mechanical (Facilities and Construction Management)
Gary Robinson	Project Leader – Electrical (Facilities and Construction Management)
Deniz Ergun	Research Policy Analyst (Climate Action)
Suma Abid	Environmental Energy Analyst (Facilities and Construction Management)
Kelly Livingstone	Planner (Planning Services)
Tricia Collingwood	Senior Planner – Current Planning – East District (Planning Services)
Amanda St. John	Sr. Economic Development Officer (Economic Development & Corporate Strategy)

### Blackstone Energy Services

*Table 2: Attendees from Blackstone*

Tim Schneider	Vice President, Energy Solutions
Darlene Remlinger	Vice President, Communications
Paul Leitch	Director, Environmental Sustainability
Shashi Kiran Ravikumar	Energy & Sustainability Analyst
Sophia Hortsing-Perna	Project Management Coordinator

## Workshop Synopsis

During the process of developing the RE Strategy and the Workshop, the Blackstone Team completed a detailed analysis of renewable energy technologies suitable for The Town, reviewed The Town’s existing renewable energy systems installations, reviewed renewable energy technology applications in neighboring municipalities, analyzed the functionality and the specifications that result in successful implementations, developed project cost estimates and co-benefits of RE technologies, and identified barriers or risks for implementation.

A Pre-Workshop Package was sent to all attendees in advance of the Workshop. This package served as a reference that outlined details of the eleven (11) technologies being presented. For each technology Blackstone provided an applicability matrix ranking, background information, a strengths/weaknesses/opportunities/threats (SWOT) analysis, and a star ranking. Blackstone also analyzed the co-benefits of individual technologies and their role in strengthening The Town’s four pillars of sustainability – economic sustainability, environmental sustainability, social sustainability, and cultural sustainability.

The following sections describe the various themes, technologies, and activities that were discussed and executed in the workshop.

Figure 1: RE Technologies Analyzed



## Co-benefits of RE Generation

Human activity drives climate change via increased GHG emissions that cannot be absorbed by natural systems. Renewable energy generation can help limit the GHG emissions released into the atmosphere. RE deployment and GHG reduction will generate co-benefits that go beyond controlling climate change, such as:

- Improving The Town’s urban environment
- Improving public health outcomes
- Reducing municipal operating & capital costs
- Supporting innovation
- Increased awareness

RE generation would also create co-benefits that can help strengthen The Town’s four pillars of sustainability. This is illustrated in the figure below.

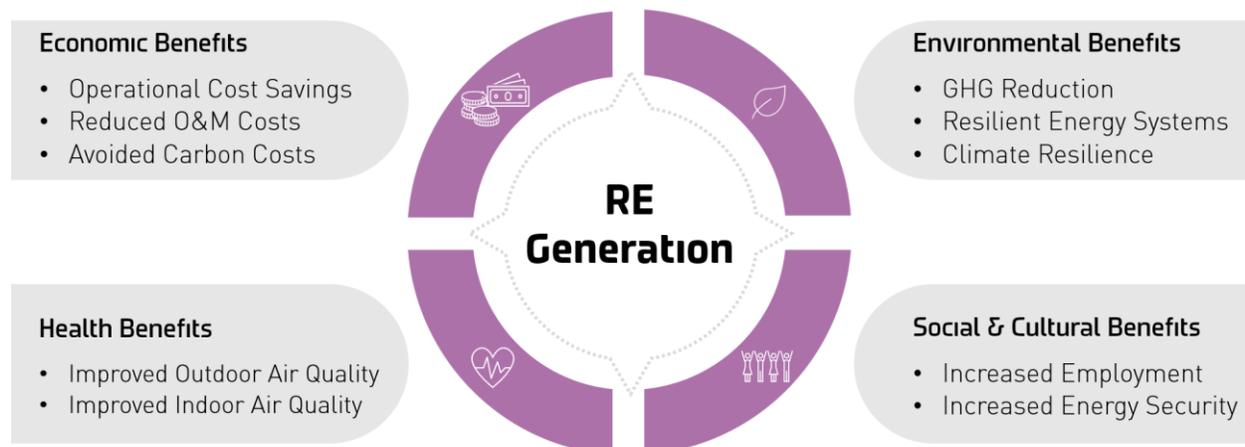


Figure 2: 4 Pillars of Sustainability

## Social Cost of Carbon

Climate change can indirectly cost businesses, families, governments, and taxpayers millions of dollars each year through rising health care costs, increased food prices and increased insurance premiums. A metric used to quantify these costs, resulting from the harsh impacts of climate change is the Social Cost of Carbon (SCC). The SCC is the measure of economic harm resulting from climate change. It expressed as the dollar value of the total damages from emitting one ton of carbon dioxide into the atmosphere per year.

Environment and Climate Change Canada (ECCC) estimates the current SCC at \$190/tCO<sub>2</sub>, expressed in 2012 dollars. This cost does not include the damages caused by extreme weather events and natural disasters induced by climate change. This is reflected in the carbon tax legislation, C12, where the cost of carbon is increased each year from 2021, resulting in \$170/tonne in 2030.

## The Town's Targets & Efforts to Date

The Town's targets were outlined to ensure that everyone was on the same page as what this strategy was working towards. The targets were pulled from The Town's 2019 Energy Conservation and Demand Management (ECDM) Plan, which include short and long term goals to reduce corporate greenhouse gas (GHG) emissions by 30% from 2014<sup>1</sup> levels by 2030, and by 80% from 2014<sup>1</sup> levels by 2050.

The Town has multiple energy conservation and RE efforts to date, including Solar PV and Ground Source Heat Pumps (GSHP) at multiple locations. The Town has made great strides in RE Technology and has many accomplishments to be proud of. It is great to see The Town on this journey and attempting to incorporate RE wherever possible. This workshop gave a deeper understanding of how the staff recognize and rank RE solutions based on current knowledge.

## Renewables Energy in Municipalities

Blackstone analyzed the climate action plans from three surrounding Municipalities including Guelph, Milton, and the Region of Peel (Brampton, Mississauga, Caledon). It was found that establishing a municipal climate action plan involved setting strategy for Climate Change Adaptation and Climate Change Mitigation. Some strategies involved a combination of both (see figure below).

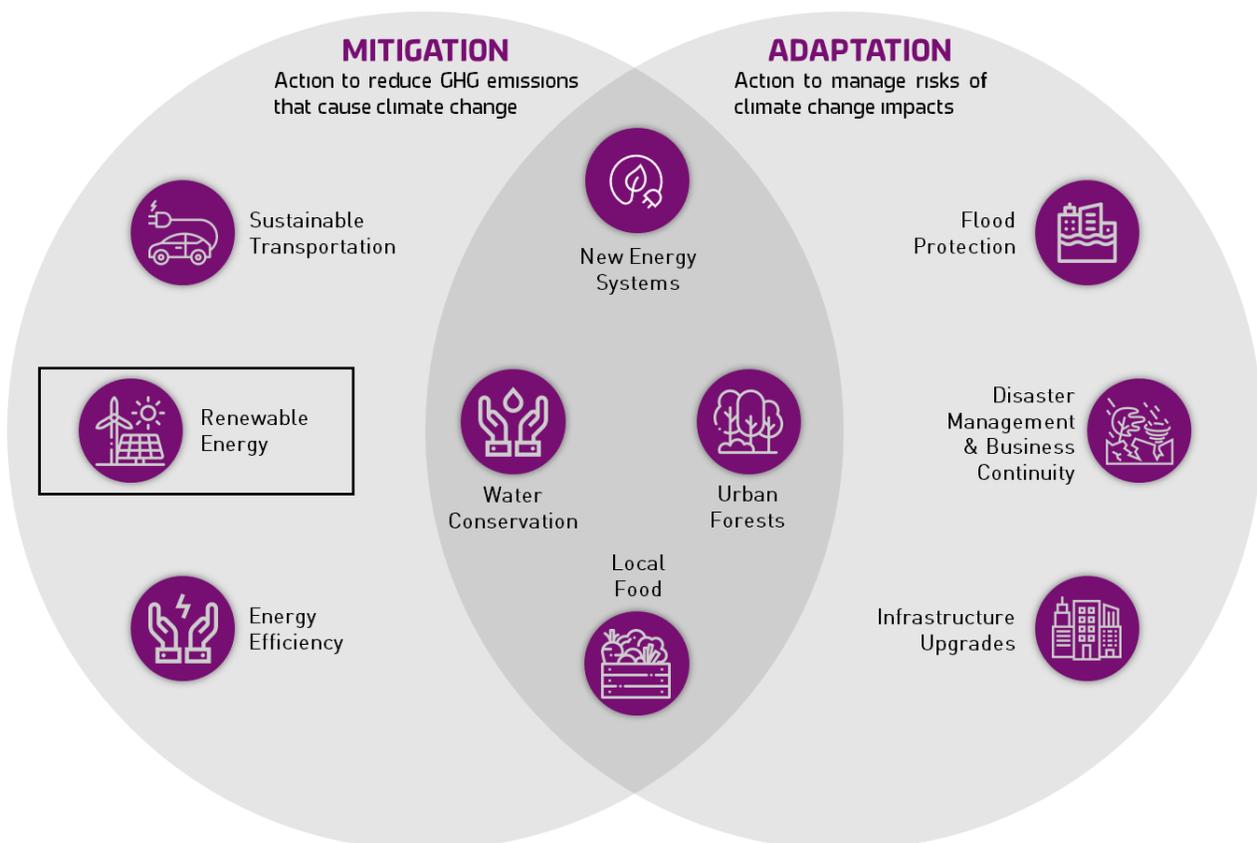


Figure 3: Municipal Climate Action Plan Strategies

Climate change adaptation is referred to the climate action taken to manage the risks of harsh climate change impacts. While climate change mitigation involves in climate action that aimed at reducing GHG emissions that caused climate change. The Workshop focused mainly on climate change mitigations as RE generation plays a crucial role in municipal GHG mitigation efforts and in GHG reduction.

It was found that The Town is in good company and is not alone in its journey through RE generation and to GHG mitigation. Two of the Cities (Brampton and Mississauga) have similar targets to The Town and all the municipalities are analyzing similar RE technologies and policies on their journey to reduce GHG emissions.

## Renewable Energy Technologies Discussion

During this section of the Workshop, Blackstone invited the attendees to offer their comments and ask questions to foster a collaborative discussion surrounding all the RE technologies.

Each technology was assessed on its co-benefits and its potential to strengthen the four pillars of sustainability, as identified by The Town: economic, environmental, health, and social & cultural. A star rating was provided by Blackstone under various sub-categories, grouped under the four pillars (see image below). These ratings were then tallied to create an overall star ranking.



Figure 4: 4 Pillars categories

The RE technologies were also ranked according to a point-based evaluation, where the overall star rating for each technology was converted and scored out of a maximum of 55 points. This is illustrated in the image below.

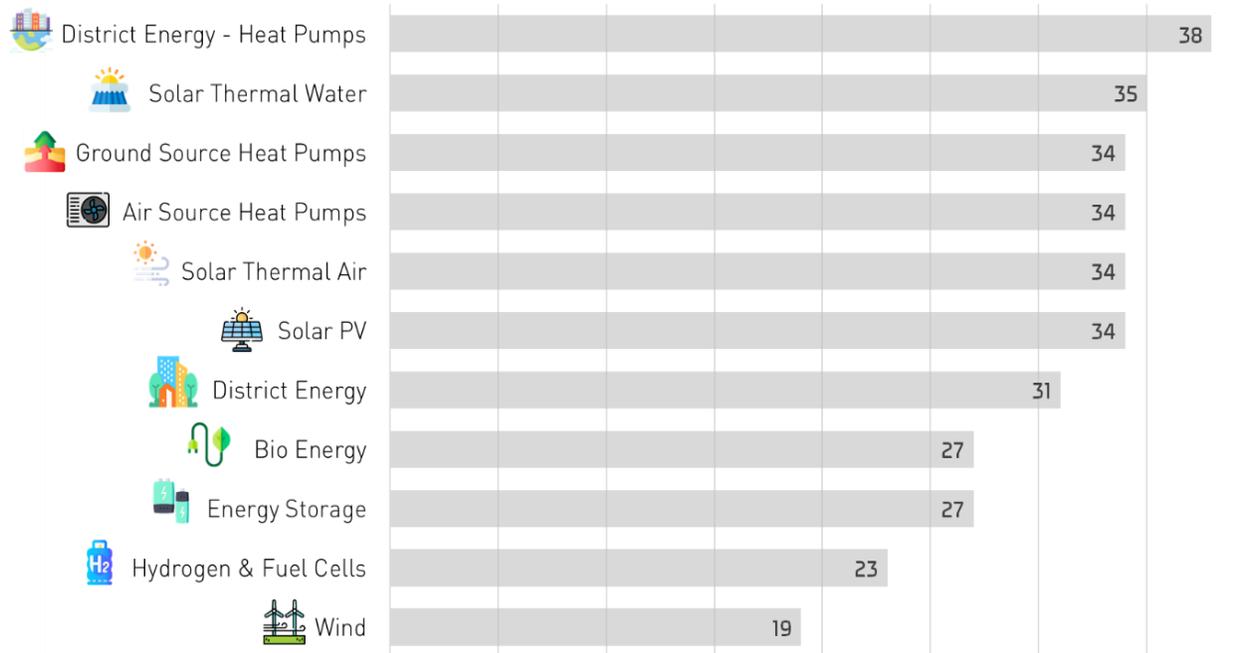


Figure 5: RE Technologies Ranking

This information was used as a guide to start the discussion and to get feedback from the stakeholders attending the Workshop. A “Questions and Answers” section outlining the items discussed is provided in Appendix 1.

## Mural Voting Activity & Discussion

As part of the Workshop Blackstone conducted a voting activity using the collaborative “Mural” platform. This process took about 30 minutes and gave all attendees an opportunity to ask any additional questions, view the star ratings, and the SWOTs for each technology.

The goal of this activity was for the attendees to take the information presented to them, and rank the eleven technologies based on their understanding of the sustainability of RE for the overall strategy moving forward, and how these will fit in with The Town becoming the most livable Town in Canada.

Each attendee was given eleven votes, however, multiple votes were allowed per technology, so that if for example, Solar PV, was a priority for them they could place multiple votes for it. This voting activity gave Blackstone insights into how different members of The Town viewed the various RE Technologies and allowed them to be ranked in order of their preference.

These results prompted additional discussion around why certain technologies ended up at the top or bottom of the ranking and was an excellent source of feedback for Blackstone. The result of the voting session is illustrated in the image below.

37 Votes	Solar PV 
25 Votes	District Energy Systems - Heat Pump 
25 Votes	Solar Thermal Water 
18 Votes	Air Source Heat Pump 
15 Votes	District Energy Systems 
11 Votes	Geo-exchange Heat Pump / Energy Storage 
8 Votes	Solar Thermal Air 
5 Vote	Hydrogen & Fuel Cells 
3 Votes	Bio Energy / Wind Energy 

Figure 6: RE Technologies Voting Results

## Closing Comments

The Town is engaged with the Community and Corporation when it comes to dealing with the climate emergency. The Workshop event today was attended to by staff from a range of departments as well as those involved with the community which shows a commitment to being a part of the solution. The information gathered from the people involved and on-going discussions will help The Town develop a RE Strategy. The following summarizes the main points brought up during the session:

- As shown in the ranking and heard during the discussions, solar (electrical and thermal) is a leading technology for renewable energy contribution. This is to be expected, solar is high profile, growing around the world, getting less expensive, quiet, and is well known.
- To achieve significant PV contribution The Town will need to watch for and consider virtual PPA opportunities. As these evolve, The Town can plan to implement PV on the rooftops and take advantage of net metering.
- Solar heat also ranked high as it is also recognized, understood, and has a track record. Due to the low cost of natural gas they will have long paybacks (>20 years) until the cost of carbon is included which reduces the payback to <18 years by 2025.
- It is interesting that solar air did not rank higher. This is likely because it is not as recognized though a well proven solution. Using solar energy for electricity and thermal loads is recommended.
- Heat pumps in general and district energy systems were ranked high. Heat pump technologies are very good for electrification plans. DES is being reviewed for the Town for growth centres and it makes sense to consider heat pumps. The Corporation can maintain contact and ensure any new developments include high performance standards that permit low temperature, DES heating temperatures.
- The remaining technologies (wind, biomass, hydrogen) did not register highly. In the case of wind, there are no applications other than small models for roadside lighting. Biomass, though a possible energy source, is not well known in an urban situation. Hydrogen will become more distributed and could be a transition fuel for short-haul trucks in Town.

The responses to the technologies were informed, helpful, and indicates a corporate awareness of the options. Because solar ranks high and hydrogen ranks low does not mean hydrogen should be neglected. We feel that the rankings illustrate the sense of availability to deal with attaining GHG reduction goals within a reasonable time frame. Technologies such as batteries and hydrogen are relatively new, expensive and do not have the same visual impact as solar does. They are becoming mainstream and should be monitored for opportunities to integrate into the GHG reduction strategies.

Getting to a robust RE Strategy implementation stage will require more discussions with FCM staff to ensure good opportunities and ideas are not missed. The work completed for the reports did not allow for detailed evaluation of opportunities other than high level – i.e., we could not be sure if roofs were strong enough or if the connection capacity is there for solar. Installing heat pumps requires more investigation of the HVAC equipment and how the thermal energy is delivered before educated suggestions can be made.

The net step will be to agree to how and where to install RE systems. In the Phase D report, suggested plans for PV installation at Community Centres that proposes a roll out for that archetype and could be used as a template for future PV planning. We look forward to working with the Corporation in assisting with the development of a strong RE Strategic Plan.

## Appendix 1: Questions & Answers

### Renewable Energy in Municipalities

#### Question 1

##### ***Comment from TOO Stakeholder***

The Town of Oakville has a community energy strategy that has set goals outside of the Corporation and includes recommendations around RE use. Corporate emissions make up ~2% of GHG emissions. The Town's leadership for a sustainable energy future complements the community directions..

### Renewable Energy Technologies Discussion

#### Question 1 – RE: Solar PV

##### ***Question from TOO Stakeholder***

Would we be considering large scale off-site solar installations or on-site rooftop type projects? Or both?

##### ***Answer from Blackstone***

Consideration for maximizing solar generation in existing facilities is a primary recommendation for adopting RE. Steps to take into account are available rooftop space connection capacity for net-metering, and existing roof structure.

Ground mount systems are large scale solar farms. These are typically megawatt scale, compared to the kilowatt scales on rooftops. We have laid out some of the policy and physical considerations in the Pre-Workshop package, and in our Study, about large ground mount and rooftop solar systems.

Incorporating large offsite PV, or renewables in general, virtual power plants will be possible. Brownfields and lands that aren't that useable for other functions, will become eligible for a virtual plant. These large RE sites generate electricity that goes into the grid and credited towards the Town's electricity use.

##### ***Comment from TOO Stakeholder***

We want to fully understand the context in which we are providing feedback. Considerations between ground mount, offsite, EV, etc. installations would be very different than onsite. I'll keep that in my head as we move forward in the conversation.

##### ***Comment from TOO Stakeholder***

The concept of virtual net metering or virtual power plants is going to be crucial to whether or not we embark or not in an offsite PV farm. The answer to the question depends, we need to look at each situation and see if it makes sense, and if the building is structurally sound to be able to sustain a rooftop installation. In the future if there is access to a virtual power plant we don't need to have a facility close by getting that electricity when instead its getting fed into the grid and we are benefitting as if we had our facilities right next to the farm.

## Question 2 – RE: Solar Thermal Water

### ***Question from TOO Stakeholder***

For Solar Thermal Water, can you speak to why the operational cost savings is at 2 and not higher?

### ***Answer from Blackstone***

Solar hot water is a supplement to your main heating load. So, you supplement the main boiler plant and that's where the savings are. Solar hot water systems (and solar air) are not complicated to operate. Operationally you get a lot of energy for a little bit of electricity to run the small pump or fan. From an operational perspective, there is not much to do with them so that why we took it as a low operation cost for the energy collected.

### ***Question from TOO Stakeholder***

Wouldn't that mean that operational cost savings would need to be higher for solar thermal water? (i.e., a 4 instead of a 2, because they are not expensive to operate).

### ***Answer from Blackstone***

The price of gas is low right making it difficult for solar hot water to compete on a cost basis alone, but it is a high GHG emissions source. Those are the kind of criteria when we chose the ranking. They are inexpensive to operate but there is not much savings in terms of dollars and tend to have long paybacks.

### ***Question from TOO Stakeholder***

To add to that discussion [solar hot water], I was curious about if there is any consideration of re-evaluation based on the carbon tax that's coming in the next 5/10/15 years. Is there a threshold where the operational savings might start to be much more impactful?

### ***Answer from Blackstone***

It's a relatively new line item in the financial analysis (Bill C12 passed this past Spring). We do take that into consideration, but it's not set in stone yet, so we were hedging a bit. The cost of carbon would make solar thermal, air and hot water far more appealing going forward and tend to reduce the paybacks.

## Question 3 – RE: Solar Thermal Air

### ***Question from TOO Stakeholder***

Wondering why air vs. water is 1-star higher for operational savings (assuming your offsetting a gas system). Just curious – thinking indoor and outdoor pool application (not just DHW).

### ***Answer from Blackstone***

Solar air systems operationally bring benefits because of the insulation when using a "solar wall" (which is the technology considered for the measures).

## Question 4 – RE: District Energy Systems

### *Question from TOO Stakeholder*

Not all the folks on the call here from the Town might be familiar with the work we are doing with district energy and pre-feasibility. I wanted to be really clear that it is looking at a community scope, that may or may not include Corporately owned buildings. That is something that we must go through and see if they are any sites that could be included at this very early stage of looking at district energy. As a community there is a strong push towards district energy as a supply and distribution solution to lower GHG and emissions impacts and receive all the other benefits throughout our community, whether Corporately owned buildings, residential communities, and in our business and commercial districts as well. Has there been any thought about our Corporate facilities generating supply from some of the waste energy from some of our sites? Looking at it through this lens of evaluation, either part of the supply or acting as a district energy node in and of itself?

### *Answer from Blackstone*

District energy systems can take various sources of energy into the loop. We understand from The Town's plan that you're looking at 5 or 6 different development centres, where a DES might apply if Corporate buildings are included I would think about connecting them. In terms of taking any other waste streams, absolutely, we would consider that and mention it in our final report. A good example is wastewater streams, which are good sources in large communities.

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## Mural Voting Activity & Discussion

### Question 1 – RE: Voting Activity

#### *Question from TOO Stakeholder*

When we are casting our votes, are we casting them in the frame of the Corporation of Oakville or more of a community wide project?

#### *Answer from Blackstone*

This study is for the Corporation, and the strategy going forward for the Corporation portfolio.

### Question 2 – RE: Results

#### *Question from TOO Stakeholder*

I just wanted to say I am not surprised at all that Solar PV is at the top of that list. But one of the things I would like to see being considered as part of that is how we can bridge the gap between having solar PV and people in the community spaces knowing that there is PV somewhere on the building or offsite, and being able to see or learn about what those stations are doing.

#### *Answer from Blackstone*

As a Town you have a lot of success stories and broadcasting those successes is an important part of renewable energy strategies. Adding signage noting what is happening, and point people to the successes. From a community perspective you want people to know what you're doing and that you are part of the climate mitigation solution.

### Question 3 – RE: Results

#### **Question from TOO Stakeholder**

Was surprised to see how low Hydrogen and Fuel cells rank. After attending the Smart Energy Kingston Conference if it is new technology is it just a matter of time or is it just too expensive?

#### **Answer from Blackstone**

It has been very visible and audible in the Federal strategy to net-zero about the investment in hydrogen, in particular in Alberta which has a high GHG grid. Hydrogen technically is not a renewable energy; it is a vehicle for carrying energy and how you make the hydrogen is really important. Right now, the infrastructure isn't in place. From a Canadian perspective it makes a lot of sense as we are big, we've got pipelines, and we've got applications where you can mix it in with natural gas and offset carbon. It is definitely on our radar to watch, and as I follow up we [Blackstone] will send out to the group our "Year in Energy" report, and we have a section on hydrogen where it talks about green hydrogen, blue hydrogen, and provide a little but more information.

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## Email Feedback Received

### Email 1

#### **Question from TOO Stakeholder**

Are we talking about existing projects completed? New projects? Which town facilities would be possible candidates for which type of RE projects? Examples:

- a) We have PV at many town facilities. Do we have capacity for more?
- b) District Energy program: I understood there is a concurrent feasibility study on this, however I think it would have been helpful to understand if we were looking at possibly partnering with local developers in this type or project or just using Town buildings? Not sure if we would ever corporately have the density to support these types of projects (though a hybrid would seem most logical).
- c) Air / ground source heat pumps: this is closest to my role at the town, so I have a strong understanding of which facilities could benefit from this. In terms of the visioning workshop, I think it would have been helpful to tie specific examples to specific facilities.

#### **Answer from Blackstone**

- a) We are proposing you consider PV wherever you can and will be recommending policies to reflect that. We can only do an estimated area review for more PV without being sure of the roof structure. Same for the connections – we cannot be sure there is capacity but can let you know what the potential might be (i.e., a lot more roof at 16 Mile – is there connection capacity?).
- b) There may not be a large DES opportunity for the existing Corporation sites as DES favours the supply to multiple buildings. However, if a large development goes up beside 16 Mile, a large GSHP/solar system could make up a small DES for that area. Any large developments being planned should consider DES and then if the corporation has any properties inside that area, make sure they design to accommodate energy from a DES. We would suggest a more detailed ownership model evaluation be undertaken in that regard.
- c) We were thinking a little more generally for the workshop but would like to talk to you and follow up for more ideas of where these technologies would work.

***Question from TOO Stakeholder***

We have partnered with our local utility Oakville Hydro for many Town RE projects. There are pros and cons to this model. Has this worked for us in the past? Would we possibly look at running these projects entirely through the town?

***Answer from Blackstone***

We should follow up with you about how the projects were coordinated and understand your take on that. Oakville Hydro will always need to be involved – from pre-CIA through to the final ESA and commission reporting. The level of project management by the Town can be determined depending on the scope.

***Question from TOO Stakeholder***

Building on a couple previous points, what kind of partnerships exist for different types of RE projects? I think the feasibility piece could have been more specific to our context. It felt like asking our input without being able to fully understand what that looks like. Example: PV was the highest focus strategy in our poll, however do we have many more sites to accomplish this?

***Answer from Blackstone***

Your note about Town specific is noted. While keeping it fairly generic, we will show some “for example” to give you a feel for the application. We didn’t want to get too tied up in details for applications at this time but would like to hear your (and the Town’s) ideas.

***Comments from TOO Stakeholder***

Great questions around this project and our own experience and ability to implement RE. I think it’s important to provide some background on this project: when we started this conversation, I did have the same idea of having feasibility studies on specific locations and specific technology. However, at the time, we felt like we didn’t know enough about renewable energy technologies to make these cases. We took a step back and decided to go for a study that helped us identify what technologies are out there, what are their benefits and disadvantages, associated costs, and benefits. With this information, we could then start thinking about implementation of specific technologies throughout town facilities.

DES: The Town wouldn’t own the system, but we would be users and perhaps suppliers of waste energy to these systems. The idea would be to have one (or more) DES systems that serve entire neighborhoods, and our buildings would be just one of those customers. Not something we would do alone, but something that the community is looking at more seriously lately. Regarding the model with OEC, to be honest, I do not think it’s the best approach but something that will likely be a part of the strategy on how to implement RE projects at the town.

Finally, I think we are at a point where we wouldn’t want to say no to a technology because right at this moment, we don’t have the space or ability to implement. I was interested more in learning what people’s take on RE was and if there was a strong feeling (for or against) a particular technology, so we wouldn’t even bother considering it. From yesterday’s workshop, I can see that wind and bioenergy are not something we would look into, and I agree with those statements. If we consider the other technologies, there are quite a few options in terms of development/installation/operation that can be integrated into a building with a large rooftop, or as part of the wall, or on the ground (as an example). We’d need to understand what risks and benefits are associated with the technology, to see if it makes sense for us to entertain a project of this sort. But we need to integrate this kind of thinking into the strategy, to make sure we are considering all aspects.