# **Energy Conservation and Demand Management Plans**

# **Preliminary Survey Results**

# **(as of October 25th, 2018)**

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# **Q1 What did you learn from the 2014 CDM Plan implementation?**

**Education and Engagement**

* Implementing the 2014 CDM Plan helped strengthen the City’s Corporate Energy Program. It increased employee engagement and education corporate wide and helped us analyze what are more realistic and achievable short term and long term goals.
* Plan provides structure to advance profile of energy use and both the commitment to the Partners for Climate Protection (PCP) program and the requirements of O. Reg. 397/11 have greatly increased staff awareness of energy efficiency. This includes increased awareness of the business case and leadership opportunities of corporate energy management as a “leading by example” initiative. Despite the increased motivation for corporate energy efficiency, challenges of CDM implementation continue to relate to the slow process of changing departmental business processes, such as related to planning, procurement and inter-departmental communications.

**Issues and Key Findings**

* We learned that in order to have long-term energy conservation, we need to change processes that we use to procure assets, in addition to implementing energy savings projects from energy audits.
* The City used a plan developed in 2012. I was not here during the preparation of the plan. The plan was prescriptive on projects and some were implemented as per business case. The plan did also suggest to council to approve of roughly $3 million for energy projects. The prescribed projects were implemented before I had joined with the City. The plan became out dated and there were gaps within the plan.
* It gave us an opportunity to introduce energy efficiency/conservation into corporate activities in a more formal way. It gave an opportunity to have energy conservation be recognized and considered in projects/activities implemented by the corporation. It allowed establishing a culture of energy conservation by involving departments/divisions of the corporation that have direct influence in corporation's energy consumption and involving their staff through formalized corporate energy team. The plan allowed staff to recognize the value of energy conservation and how they can contribute to improve the energy performance of the corporation. It was the first plan of this kind and we are looking at further improving it in upcoming update to the plan.
* Keep plan more high-level road map with targets, and not so detailed with specific projects because they can change year by year.
* The CDM plan was very much a compilation of targets and actions that were captured within the corporate GHG reduction plan which was finalized in 2013, coupled with the municipalities long range capital budget forecast for infrastructure upgrades that resulted in energy efficiencies (buildings, fleet and lighting). It was felt that the CDM was very much a duplication of work that was already in place, however it has been a useful reference guide to track their progress. That being said, the plan did help increase internal discussions on corporate actions on GHG reduction (tying in building maintenance, environmental, fleet and infrastructure management).

**Inter-Departmental Collaboration**

* The development and implementation of the 2014 CDM was undertaken collaboratively with key staff across all Regional operational areas including but not limited to, water and wastewater, paramedic services, police services, long-term care and social housing and facilities/maintenance. Energy is a key consideration for all areas although the challenges, program pressures and available opportunities faced may vary. Common themes around measurement, awareness and development of standards were found through workshops, surveys and additional working group follow up.
* Biggest lesson is lack of available financial resources to implement recommended projects. Municipality was not prepared to allocate a fixed budget to put towards projects. Instead as projects came up, Sustainability / Energy Management Staff work closely with Facilities / Mechanical Services to provide info, review, using energy management lens other lessons - challenges to work with staff from other departments and getting involved in their work plans.
* Simple pay back is not a good way to calculate return on investment for energy efficiency projects (use avoided costs) 2. Developing a comprehensive financing strategy to pay for implementation during plan development is as important as establishing a GHG target or vision. Not articulating the financial case sets CEP's up for partial/complete failure 3. CEP implementation is by default a cross-disciplinary and cross-departmental initiative, so you need to involve everyone who controls the Town's energy use (i.e. facility operators, fleet, etc.) 4. implementation cannot be successfully done without dedicated resources.
* We identified areas with the most opportunity for growth (procurement policies, engagement/training, target setting), and setup measures to help us improve. Some were achievable fairly quickly but others will require on-going commitment and evolution (ex. training/engagement).

**Budgetary Issues**

* That much of our infrastructure is greatly behind in regards to energy management and the financial requirements for upgrading are higher than we can afford in the short term.
* One of the most important things that we learned from the 2014 implementation is that you need to have a good source of potential projects to lay the plan out. It is difficult to plan years ahead of time and secure capital dollars due to the municipality’s budget scrutiny and constraints.
* That an annual budget, annual dedicated staff time, senior management to be on board and the partnership with the manager of facilities and their staff is critical to the CDM Plan implementation.
* The CDM Plan included many projects that did not have specific funding approval from Council. This is an ongoing issue at the municipal level but in our experience projects with a solid business case tend to be approved. Energy Efficiencies are not always the main focus of our client groups that are focused on public facing programs and service delivery.

**Possible Improvements**

* The Province direct incentives for the implementation of the plan should be greater to keep momentum and maintain prioritization. They would have also benefited by putting in place a formal reporting element. Lastly, the lack of information sharing and recognition of the Plans across Ontario led to this work being undervalued.
* I did not play a role in implementing the 2014 Plan. In reviewing the Plan which, to be honest, I do not consult with regularly, I've drawn some conclusions: -the 2014 Plan seemed to be a dumping ground for EVERYTHING the municipality had done to date and was planning to do. While it was a commendable effort, it made it a very cumbersome document that is hard to navigate and identify measureable actions. - targets are quantified broadly but not specifically. For example, a high, medium, and low savings target (in MWh) is set for the entire municipality. However, individual actions are not quantified at all. -technologies and paybacks change often and quickly in conservation over a 5-year period, so 2014 decisions and targets don't align with current realities (e.g. LED lighting retrofits weren't always justifiable in 2014, while a no brainer now).
* I learned that having a plan with specific energy targets approved by the organization's executives helps a lot with allocating funds towards energy conservation projects. Having in-house resources to execute the plan ensures good results and sustainability of the achieved savings.
* Our previous CDM Plan had a large portion of it dedicated to cost savings based on fuel switching to natural gas, which had to be abandoned due to our new carbon related reduction goals. Some of our goals in our previous CDM plan did not have the methodology behind what should be involved in the calculations to report on them. Our previous plan also had a number of goals related to fleet savings, which should have been incorporated into the green fleet strategy for the city rather than in the corporate energy plan.
* Valuable to establish a Corporate Energy Team to oversee Plan implementation and to meet regularly to keep up the momentum and share lessons learned among facility staff. Involve all levels of Facility staff (Managers, Supervisors, Coordinators and Operations staff) - Valuable to establish a dedicated budget line to implement energy retrofit projects. At the Town of Caledon, we have an Energy Revolving Fund that is independent of the tax base that regenerates with the revenue from 3 solar PV microFIT sites. - Facility staff training and education in energy efficient operations is important. - The Town's 2014 CDM Plan had 36 actions, and as of 2018 the Corporate Energy Team has completed close to 130 energy conservation measures between 2014-2018. The approach for 2019 will be to move away from the prescriptive action-based plan, and take a broader policy-like document of energy efficiency best practices that can be implemented in facilities.
* The 2014 plan focused on the low hanging fruit (items with obvious economic benefits such as LED conversions) and were largely implemented during the 2014-19 implementation window. One of the problems with the 2014 plan was it employed simple payback to calculate return on investment, and those savings did not materialize due to the increasing per-unit cost of electricity. The updated plan will no doubt contain actions that lead to a dual reduction of GHG emissions and cost, but those items will be assessed using more complex and nuanced financial calculations than SPB.
* Things usually ending up cost more than you think they will. There is almost never enough staff, resources, money and time to do everything we want to do. Energy savings and avoided cost can be costly and difficult to prove and also more difficult to explain to Council than to Staff, especially if energy bills and usage continue to go up. There is starting to be a diminishing return on investment as "deep dive" savings rise to the top of the opportunities pile. GHG-reducing opportunities can be extremely hard to justify based on the economics alone.
* Identification of specific projects with pricing / payback and savings is not a valuable exercise as these figures become outdated and irrelevant. Plan should be more holistic and identifying processes and best practices to implement that lead to savings and achieving targets.

# **Q2 How are you planning on reporting on progress of your 2014 Plans in your 2019 Plans?**

* We report annually to Council on progress.
* Track energy usage and projects annually. This information is available on City website and updated annually. Annual reports from past five year will be used to report progress.
* We have been monitoring energy consumption in our buildings and the numbers will be incorporated.
* PCP and the ClimateWise Business Network provide a framework for reporting on progress. The City will also undertake a brief scan of existing sustainability reporting approaches, such as the Global Reporting Initiative and Compact of Mayors, to understand the differences between the City’s progress reporting and existing international approaches.
* First annual report submitted to Council this year. Did not go over each recommended item. Rather it provided accomplishments; consumption, savings, areas that need improvement
* The ECDMP was closely linked to pre-existing goals within our corporation. Therefore, our climate change or procurement goals were reported through other existing channels within the Region. There was not a specific ECDMP status update. The 2019 ECDMP may speak to our past goals and project success, but will not be purposefully focused on the 2014 ECDMP implementation
* We will use in-house resources to write the plan, consulting departments and summarizing all the energy measures implemented and planned for the next 5 years, showing the benefits of each of them.
* Our target was 5% energy intensity reduction by 2019 and so far we achieved 9% reduction. We report on the achieved savings every year and it will be simple to include this reporting into the next plan.
* Include an appendix or a chart which lists any energy efficiency initiatives which took place during that span of time. We have an annual list, so it is simply a matter of combining all of those lists together.
* We continue to provide annual reports to our council and these are made public on our City website. These reports outline our targets and results for the current year in comparison to baseline year.
* Clear targets and performance measurement methods were not clearly outlined. Because of this monitoring and verification is not easily done. Also the projects were installed, but M&V was not planned out for the projects. Reporting has been provided on an absolute basis and also an intensity basis (per capita as indicator).
* Summary (to greatest extent possible) of all completed initiatives over last 5 years which had an energy efficiency component or consideration (whether quantifiable or not). All large-scale capital projects including new building construction and standard build versus baseline OBC as well as all major refurbishments and/or replacements of equipment as well as process changes that have resulted in energy savings (with measure savings through LDC M&V process, where possible). Note work plan for 2019 CDM renewal still in development
* We have created an Energy Report, which outlines progress made on the 85 actions that were included in our 2104 Plan. This report was developed to provide Council and residents with a high level implementation status report. We are in the process of supplementing the information contained the in that Report in order to meet the reporting requirements for PCP Milestone 4
* We have established linear regression models to establish savings against the baseline.
* Plan to report on progress in high level parameters (e.g. total energy savings accumulated, energy intensity trends). Briefly summarize projects undertaken to contribute to these savings. Briefly summarize organizational changes undertaken to contribute to savings and overall culture of sustainability.
* Currently working with consultant on our revised CDM plan and we haven't discussed the specifics of the framework yet.
* Likely via a table with simple symbols that represent the level of completion of each action. An additional column in the table will be used to further describe progress. We will use Energy Performance Analysis results using RETScreen Expert to report back on the progress towards the 2014 target. The Town continuously tracks energy conservation and efficiency measures completed in facilities through it's 'Watts Going On' roundtable discussions during Corporate Energy Team meetings. We will share the summary spreadsheet of all energy conservation measures completed in facilities.
* TBD. I'm considering listing the 2014 measure with a status update in a table at the beginning of each relevant section. Also might include a summary table of all measures in the appendix and an overview of performance in the executive summary. The 2019 measures will either build upon any incomplete/still in-progress measures or set new measures. Trying to avoid making this plan too large....
* We will review the implementation plan of the 2014 plan and provide a report on how we did in terms of implementation of measures in the plan. We will report in terms of how many measures in the implementation plan were implemented, what were the expected and actual energy/cost savings etc.
* We conduct a corporate GHG inventory each year, it is likely that this will be used as the primary indicator for measuring the success of the CDM Plan alongside a summary of the projects that were completed.
* Looking into updating existing plan or creating new one based on budget approvals.
* Something like another chapter or addendum to the existing plan - consider the whole thing a living" document". Not re-inventing the wheel. Just make it to the point. Too much time spent on making a pretty-looking plan update (that frankly, very few people will read) can take away time and resources from actually implementing measures that would help achieve targets. Will use calculations with various combinations of sub-metering and manufacturer specs. Utility meter level data may be used on occasion but have not had time to build models, baselines and CUSUM's, sadly.
* High level report with limited detail as an introduction. Will focus on key successes as examples of activities / best practices that will form the basis of the 2019 plan.

# **Q3 What targets are you exploring for the 2019 Plan?**

* We have yet to establish a new benchmark for 2019.
* Will work on efficiency improvement, i.e., having ekWh/sqft targets. We will also work on Green Fleet strategy, increase the number of energy audits/studies, explore into ISO 50001, increase the capacity of renewable energy and work on developing policies and standards for adopting sustainable technologies.
* Considering using 2014 as a baseline; still working on how to best outline a target. Will likely be EUI based and compared against a suitable benchmark or “best in class” target.
* Still need to achieve 2014 targets; will also incorporate water and gas; just beginning to prepare Terms of Reference.
* 2019 targets will be aligned to the existing corporate targets, 80% reduction of CO2 emissions by 2050 against the 1990 baseline. Our targets are focused on a broader Climate Change target (CO2 emissions), and to track progress the Region has a detailed GHG inventory which captures GHG emissions from electricity and natural gas emissions. Also developing a Climate Change Plan which will provide the long term strategic planning and roadmap for climate change actions
* Energy savings kWh, # of procurement processes reviewed and changed, # of energy training, # of communications, # of renewables implemented.
* The targets are directly related to the investment and they need to be approved by the sponsor. We are thinking at maintaining the 1% reduction per year and try for more if more funds become available.
* We would like to set our GHG targets as part of the PCP stages. Have recently become members.
* Our targets speak to 2030 and 2050, related to energy intensity, CAFE, GHG reduction and process water efficiency.
* July 2018, council has defined the Corporate target to be 100% renewable by 2050. As such, this will be the target for the 2019 plan.
* Continued refinement of energy benchmarks and related KPIs such as energy intensity by either facility or operational area with consideration for aligning with O.Reg 588/17 under the Infrastructure for Jobs and Prosperity Act, 2015 (i.e. Section 5(2)2). Note work plan for 2019 CDM renewal still in development
* The overall goal is to reduce GHG emissions by 80% by 2050. The development of the plan will involve the identification of an interim 5 year target that the 5 year action plan will be built around that target.
* We are still in the planning phase and have not set targets for the 2019 Plan.
* Energy Use and GHG per square foot of facility space. Energy Use and GHG per FTE staff. Energy Cost Intensity ($/ft2). Total renewable energy generation as % of demand. Fleet Fuel Efficiency & GHG per vehicle and FTE staff.
* General reduction targets for % of Elec, natural gas and water as well as GHG. Possibly a target for kW of installed renewables?
* It is early in the process to say, however the approach we will be taking to determine 2019 targets is through: a best practice scan of municipal CDMs locally, nationally and internationally, energy standards, and engagement with the corporate energy team to determine a feasible target.
* TBD - likely energy/sq ft, energy/capita, and GHG/capita. Will investigate aligning with our MEP.
* We are considering to establish an energy reduction target in terms of overall energy use intensity (EUI) in the 2019 plan.
* We are currently reviewing the feasibility of matching the Provinces GHG reduction targets alongside those that have been preliminarily identified in the Community Energy Plan. We also plan to redo energy audits on all of the major municipal facilities to identify what work can be completed, in order to help develop actions in our long term capital forecast and the CDM plan. This will allow us to identify what targets are feasible. We are also looking at updating the green fleet strategy by the end of 2018 which will be incorporated into the plan.
* Will need to revisit
* Uncertain yet - perhaps 2% per year reductions or avoided energy usage / costs. Perhaps develop a community wide GHG inventory / plan - ($$$?) (May be needed for grant opportunities).
* Unsure, likely an intensity based energy target with an ambiguous GHG focus.
* We haven’t talked about targets yet

# **Q4 What type of Retrofit/Capital Measures are likely to be in the 2019 Plans?**

* Lighting retrofits have been our primary focus, this will continue into 2019.
* Lighting Retrofits. Environmental management Control Systems renewal (EMCS) and upgrades (BAS). Organic Rankine Cycle Engine. Floating head pressure refrigeration controls. Rooftop HVAC replacements. Constructing new builds to LEED silver standards. Increased facility and wastewater treatment plant energy audits.
* Hoping to have updated energy audits for all facilities completed in time, which will identify specific opportunities for each facility, e.g. LED retrofits, equipment upgrades, to save both electricity and natural gas consumption primarily, but also identifying opportunities for water consumption savings.
* Likely some carry over from 2014 plan
* Insulating walls and roofs. Anaerobic digestion for bio-gas collection and cogen. Efficient aeration. Greater monitoring and controls of pumping systems. Retrofit heating and cooling equipment, motors, pumps and lighting. White roofs and green roofs. LED lighting in facilities and regional roads.
* Windows, residential furnaces, lighting, PV's, solar hot water, solar walls, sub-meters, data analytics tools, BAS with energy management features.
* We will continue with LED lighting upgrade until we achieve a full replacement in city's facilities, Ice plant optimization, pool operation optimization, BAS installations, variable air and water system, integration of booking system and BAS, heat recovery systems, etc.
* We have a list of various items included in the upcoming annual operational budgets, but these all need to be passed by council, which will be late this year, due to the fall municipal election.
* Currently we have LED lighting upgrades, a solar wall and expanding our renewable energy production in areas such as solar, storage and RNG.
* Non-decorative streetlight conversion to LED with adaptive controls. Commencement of WWTP aeration upgrades. Sewage pumping station decommissioning to be replaced with gravity feed. Water pumping stations to be upgraded to VFD. Pool drain water heat recovery. lighting retrofits. BAS upgrades
* All planned major capital undertakings with an energy savings component as well as planned equipment replacements/upgrades as well as process changes which expect to result in energy savings or avoided energy usage/cost. Note work plan for 2019 CDM renewal still in development
* Fleet-wide EV assessment to identify suitable vehicles for replacement to EV/hybrids 2. renewable energy projects (thermal) 3. deep facility retrofits 4. employee work from home program
* We have not addressed what type of projects will be included in the 2019 Plan. We plan on investigating equipment efficiency improvements and building commissioning.
* Development of green construction standard. Targets for conversion to new efficient equipment (e.g. all non-LED phased out by 2021). Standard for new equipment (e.g. all furnaces must have SEER of more than X).
* Continuous recommissioning. Lighting upgrades. Renewable installations (net metered). Deep energy retrofits, maybe looking at some storage.
* We will be attaching a summary of all of the retrofits recommended via recent energy audits that were conducted in facilities. The 2019 Plan will be exploring policies and procedures that embed energy efficiency for implementing retrofit/capital measures that have an energy impact, particularly for projects that are managed outside of the Energy division.
* Improved M&V, build upon progress with centralizing BAS, utility bill management and analysis, GHG reducing projects.
* We conducted a detailed energy audit of the top energy consuming facilities that recommended a number of capital and operational energy conservation opportunities. They will be captured in the implementation plan of the 2019 CDM plan and will be implemented over the next plan period. In addition to that, life cycle replacement projects occurring over the 2019 plan period that have energy savings opportunities will also be included in the implementation plan.
* We will look at capital projects in the following areas: Fleet; Municipal Building Upgrades; Outdoor lighting upgrades; Renewable energy (solar); Education & awareness
* LEDs retrofit will always be there with or without incentives. But would like to phase into more innovative projects i.e. Smart Metering, District Energy.
* Lighting VFD's, motors and controls for air handlers. Waster process efficiency improvements. Wastewater pumping efficiency improvements. Building automation and control upgrades/building recommissioning. Solar Net Metering - depending on economics and LDC station/feeder capacities. Ice rink/arena ice plant equipment upgrades/replacements and recommissioning.
* Conversion of all lighting to LED technology. VFD deployment. Renewable generation deployment. Recommissioning /system specific optimization efforts. Peak shaving/global adjustment reduction. Building Automation system optimization and standardization. Proliferation of new sub metering technology.

# **Q5 How are behavioral actions likely to factor in 2019 Plans?**

* As we have dedicated energy management staff available, more focus will be on employee engagement programs in 2019 plan.
* The City is not able to report on any programs or progress relating to behavioral actions. This will likely be approached using a “best practices” scan and recommendation for action with energy and GHG savings estimates and cost estimates for implementation.
* This is a continuing challenge; therefore very likely
* Identifying and powering down idling equipment during certain periods. Applying operations and maintenance best practice to equipment. Also incorporating climate change into long term financial planning and sustainable procurement policy.
* Measures to affect behaviors will be through energy training and communications of energy projects implemented and their benefits.
* We have a comprehensive behavioral change plan and we will continue to implement it. We have installed real time metering system in 21 facilities, the most energy intensive and the energy and water consumption can me monitored and controlled in real time. The dashboards we created are available to all building users and they are being educated on their building consumption and ways to conserve it.
* I would like to have an education and outreach program developed to engage all staff, as part of our updated plan. Since we have yet to do that.
* Corporate Energy Steering Committee. Peak day communications and revision to the Corporate Energy Policy all result in enhanced behavioral actions. Kaizan and Six Sigma are becoming commonplace across City departments.
* We are trying to incorporate awareness through communications. Onboarding training on corporate energy management.
* Continued opportunities for education, training and awareness, where possible. Leverage LDC programs and expertise for educating staff and information sharing through the Energy Advisory Sub-Committee. Note work plan for 2019 CDM renewal still in development
* Less prominently then in the 2014 plan. The 2014 plan focused on low-hanging fruit and low/no cost items of which a large proportion were behaviour-related. With the new plan, the behaviour-related actions will be driven by data rather then the "do good things for the environment" argument. Our facility operators will have access to energy consumption data for their facilities and will be able to monitor how behaviour changes affect energy use patterns at their facility, and fleet operators will be given reports that show things like fuel consumed per unit of work, events, etc. We want data to drive behaviour change.
* We will continue with awareness campaigns with staff and energy management training which was well received.
* Not a big player but some attention. Overall culture of sustainability developed through Green Teams, develop awards program to acknowledge everyday 'green deeds', develop behavioural programs that can be rolled out to all sites (e.g. turning off lights, conserving).
* Constant education, training and engagement need to be a part of the plan, not sure if that will need to be a goal related part of the plan but I would expect that we will set aside a small part of our budget for engaging and training staff on their buildings energy and systems.
* Dedicating a section of the Framework to Organizational Integration, which will involve doing a SWOT analysis of the existing Corporate Energy Team and looking at opportunities for enhancement. We will continue to empower facility operations staff with ongoing energy reporting and training and education opportunities. Continue with Energy Awards Program, which awards facility staff that show exceptional efforts with energy conservation in their facilities.
* Expand on our existing Battle of the Buildings competition and investigate adding more training.
* In addition to the capital (technical) energy conservation opportunities, the 2019 CDM plan will also include quite a few behavioural opportunities including developing standard operating procedures (SOPs), providing periodical energy conservation training to facility operators, etc.
* Education and training opportunities will be explored in the development of the plan.
* Vital part of the 2019 plan, which will be included through response from stakeholder engagement.
* Building automation systems and recommissioning plans depend almost entirely on staff using (and continuing to use) the available features, alarms, set-points etc in an optimal way.
* Technical staff training and awareness. Overall awareness campaign. Water/Waste water and Recreation Optimization Group formation
* Not being considered at this time.

# **Q6 How are operational saving opportunities likely to factor into 2019 Plans?**

* There have not been significant "savings" to date. Retrofits have allowed us to continue at baseline versus reduction, from a costing perspective.
* Savings associated with re-commissioning as part of the EMCS projects. Current energy studies and process efficiency upgrades at water operations will result in savings in the coming years.
* There may be no budget for increased energy efficiency upgrades. Behavior and operational changes may need to be our focus moving forward.
* Would like to explore this further through a “best practices” scan.
* Need to identify where the savings will be experienced; educate those that manage; biggest buy in could be in this area.
* We will be rolling out a climate change operational policy which enables departments to embed climate change into their day to day operation and decision making. This will likely have a positive impact in identifying and implementing various operational opportunities. These could include for example, identifying and powering down idling equipment during certain periods.
* Operational savings will come from building re-commissioning processes and review of asset procurement processes.
* As the community centers are the biggest consumers, we allocated a lot of time to understanding their operation, requirements, particulars, existing technology and other factors influencing the energy consumption. We tested an operating procedure which proved to be a good practice which saves energy and equipment run time. We want to expand this to all our ice plants. We also installed a cold water resurfacing system which proved to be successful and we will expand that as well.
* The largest single user of energy is the Water and Waste Water Division. This division is working on various strategies and KPI's to enhance operational savings on an ongoing basis. This combined with the Class A Peak day actions have led to significant results in operational savings to date. BAS installations and implementations of BAS policy also contribute to operational savings.
* Not sure yet, but it will be tracked.
* In reporting back to Province on success over past 5 years, summary of all completed initiatives and estimate energy savings/cost avoidance. Areas of success may also identify further areas of opportunity or where no further work can be completed to yield material savings.
* Prominently to the extent possible. We are planning on factoring in performance testing and energy audits in order to find savings operationally.
* This will be rolled into retrofit/capital.
* I'm not quite sure what you mean by this question but I would think that operational savings would be identified through a re-commissioning process and captured as a low cost/no cost project and verified through the whole re-commissioning process.
* We will be looking into base building minimum energy efficiency standards, for example recommending energy efficient temperature set points through best practice energy efficiency standards such as ASHRAE. We will be running a pilot period to test the recommended setpoints and make adjustments as deemed fit for the facility. We will seek opportunities to empower facilities staff to improve operations and behaviour and optimize building energy performance.
* Battle of the Buildings, Re-Commissioning, improved automation setpoints.
* Operational saving opportunities will also be included in the 2019 CDM plan. This will include developing SOPs, trainings, exploring new and innovative technologies, implementing pilot energy conservation projects, creating checklist on energy efficiency/conservation for new capital retrofit projects, expanding energy tracking system, etc.
* Operational saving opportunities are a major driving factor of projects identified in CDM plans.
* Vital part of the 2019 plan.
* Hugely
* Significant, plan will likely include a number of practices that focus on monitoring, tracking and investigation of operational activities.

# **Q7 How is energy monitoring likely to be incorporated into the 2019 CDM Plan?**

* Not likely as this is a manpower requirement we don't currently have.
* Will continue to track usage patterns by Energy CAP and interval data using Green Button data available from utility. We are completing a database clean-up of our utility consumption. This will streamline analysis, benchmarking and reporting. Aim to tune individual meters for weather dependency.
* Energy meters will be included in our BAS design and installations.
* Options for energy monitoring will be described and a recommendation provided. This may be described in a “low/medium/high” scale in terms of ability for tracking and anticipated cost of tracking.
* Similar to 2014 plan; through Energy Conservation Officer staff person; Energy Metering
* Energy monitoring is key to ECDM projects. Have a number of real time electricity meters in place that are fed into a system which allows for trending of use against budget and overall energy intensity comparison of buildings within a portfolio. The region also has a software platform in which all utility billing data is stored and which allows for trending and analysis of the energy data on a yearly/monthly/day basis and can be used for benchmarking energy performance year over year.
* We are working on internal processes to have an energy monitoring plan implemented that includes data collection, reporting and action.
* As mentioned before, we have installed meters in 21 facility and sub meters in 4 facility. Our plan is to have all ice plants sub-metered by the end of 2019.
* We are planning to ask for budget to purchase energy management software as an action item of the 2019 plan.
* We update the energy committee on an annual basis and city council is also updated on an annual basis.
* Energy monitoring will continue to be an ongoing part of our strategy in areas that include, utility meter data analysis, billing data review, budget review and creation.
* Energy performance will be reported. Appropriate monitoring to be in place. Utility bills will be the end all be all. Sub metering of significant energy users
* Discussion of annual reporting, internal benchmarking, sub-metering of facilities and equipment, where appropriate.
* 100% will be part of the plan. We acquired an energy management information system during the implementation of the 2014 plan and the goal is to integrate regular energy monitoring into the job responsibilities of our facilities staff.
* We have a database of energy with cost and use from 2011, which also includes fuel information. We will continue to add to this database.
* More of a factor. Currently have EnergyCAP (still less than a year old here) and need to enhance communications with building operators to be aware of their use. Expect that real-time monitoring will be slowly rolled out, hoping to have 5-6 key sites online in next 5 years.
* We currently have an energy management system and a sub metering system that will likely be focused on operations/training/staff engagement portions of our plan to ensure that staff are aware of the systems we have available and are trained on how to use them. We would also review the possibility of expanding to gather more granular water and natural gas data.
* We will be dedicating a section of the Framework to Monitoring & Verification strategies that recommend which path and level of M&V should be pursued for projects. We will continue using RETScreen Expert to monitor individual facility and building portfolio energy performance.
* We are planning on developing a metering, monitoring, and verification program. First steps will be to survey the market, our existing metering systems, and other municipalities. Narrow down to a couple "brands" that can integrate to one common platform; develop a general spec. Then develop a go-forward strategy of how we can best utilize existing meters and where we want to add new meters.
* Methodologies on how to track the energy savings and metric to assess the success of implementation of proposed energy conservation opportunities and overall plan will be developed and included in the 2019 plan.
* Annual energy/GHG inventory
* Through the gradual plan of integrating energy management systems into all City facilities, "if you can't measure it you can't control it".
* This is a perennial issue. We are always on the lookout for economically viable ways to monitor energy.
* Significant component, plan will likely establish a baseline of monitoring for deployment throughout existing and new infrastructure project.

# **Q8 How are Renewable Energy opportunities likely to factor into 2019 Plans?**

* We have tried to incorporate renewable energy into new builds but it is not a standard for implementation.
* Working on landfill gas utilization. Currently working on upgrading available landfill gas to system grade RNG and pumping it to Fortis BC. Once the ROI is recovered, excess gas will be used in garbage CNG vehicles and to offset our own GHGs etc. Also, another project that is already struck to be completed in 2019, East Community Centre will have a 10kW rooftop solar PV.
* Specific renewable energy options will be described, but concrete recommendations will not be made. It is likely that a Request for Information or Request for Expression of Interest will be used to obtain more information about the financing options, performance expectations, and long-term cost savings from renewable energy opportunities.
* On a project by project basis such as; possible expansion of existing Cogen plant. Anaerobic digestion for bio gas. Alternative fuels such as high renewable content fuel blends in fleet vehicles. Potential opportunities for solar PVs at various facilities. Also included are heat exchange and energy storage opportunities (not directly renewable).
* We are working on 5 new PV net-metering installations for the next 5 years, with few other renewables such as solar domestic hot water, solar walls and geothermal.
* Not sure. possibly the consideration of using geothermal energy to contribute to the heating and cooling of our new community center.
* Plans to develop increased solar, storage and RNG will be assessed and implemented based on the business case. Incentives play a key role in viable business cases.
* Will factor in since council target is 100% renewable by 2050
* Continued review of renewables such as solar for facilities and operations on a case by case basis, where deemed feasible. Investigation and implementation of technologies for alternative utilization of biogas as produced at WWTPs (and possible for organics management as being currently reviewed/considered)
* It is opportunity dependent, but we will look for opportunities in the 2019 plan.
* Renewables will be a project of interest going forward for Burlington, we will need to be installing them on a net metered basis for PV and including feasibility for ground source if we want to achieve our carbon goals.
* We will be dedicating a section of the Framework to Renewable Energy and Storage that will consider approaches for the adoption of renewable energy generation and storage to offset corporate energy consumption and GHG emissions.
* Likely minimal progress with Ontario funding cut and long ROIs.
* Details on existing renewable energy systems and their annual energy generation capacities/energy harnessed will be captured in the plan. We are also thinking about adding section on net metering in the plan.
* Likely. At least one project identified.
* Somewhat as Net Metering, Solar Thermal and District Energy opportunities arise.
* Very likely especially thermal
* Net Metering
* Significant, co-generation, net-metering will likely be identified.
* We will definitely be exploring renewable energy opportunities.
* Don't know yet
* Not in a big way. Still hindered by costs and payback.
* Probably not.

# **Q9 Are you including fleets in your 2019 Plan?**

|  |  |
| --- | --- |
| No | 25% |
| Yes | 46% |
| Not Sure | 29% |

# **Q10 How are you thinking to include Demand Response into the 2019 Plans?**

* Demand response plans at this point relate largely to curtailing use at our single Class A eligible facility during potential peak setting hours.
* Demand Response has not been a focus of CDM Plan implementation. The City needs to meet with utility to better understand Demand Response opportunities in relation to reducing electricity costs.
* Through possible energy storage opportunities at a number of facilities, this also ties into peak demand response for utility bill savings through Global Adjustment.
* We will keep exploring feasible projects on demand response.
* Not sure. Need to discuss with our new facility manager and our utility.
* While we are not officially part of the demand response program we do manage peak loads for our class A sites and larger corporate buildings during peak days.
* Not solely demand response. Looking to achieve demand response through overall conservation
* Municipality currently has 9 end use accounts in the Industrial Conservation Initiative (ICI) for peak demand curtailment. Continued demand curtailment efforts as well as possible review/consideration of storage technologies where deemed feasible (none in place now.
* We are interested in talking to the IESO about piloting a virtual distributed demand response project
* We currently have demand response on a couple of buildings but I could factor into carbon reduction significantly if we choose to do it on our on to shift our load to a less carbon intense energy mix. This would depend on how we do our framework for how we will be accounting for carbon emissions.
* We will not be looking at Demand Response at this time. Our facilities are not at a size where the business case warrants demand response, but as new facilities come online and facility expansions continue, we will relook at Demand Response.
* Low priority - will evaluate feasibility.
* Yes, we want to include a chapter on Demand Response in the plan.
* No sure yet.
* Integrate any facilities which classify as Class A customers.
* Not much
* DR will likely be included within the monitoring / tracking and submetering portion of the plan.
* Unknown
* We tried it in the past and didn't work well, we may try it again but there is no plan for that now.
* We are not planning on including Demand Responses into the 2019 Plan.
* Haven't thought about it and don't have an answer right now.

# **Are there any additional actions not mentioned already that you think will likely to be included in your 2019 Plan?**

* We hope to add water to our 2019 Plan.
* Will include a section about our informal Corporate Energy Team, which includes staff from Policy Planning and Environmental Sustainability, Facilities, Corporate Asset Management, Engineering, Finance, and IT/Data Management. We find that it’s important for this group to meet regularly in order to ensure active progress on CDM actions and tracking. Although not an action, a discussion of the financial framework is anticipated to be a component of the CDM Plan revision. This may include discussion of an “Energy Fund” or “Conservation Reserve” as well as financing options beyond debentures to consider “green bonds” or other financing options.
* I would definitely like to ask budget for a full time or 50 % staff person to manager energy efficiency initiatives and to implement the CDM plan.
* We will be taking a holistic corporate GHG reduction approach for the 2019 Plan. We will focus on the following: facility energy conservation, water conservation (parks & facilities), waste diversion (reduction of single-use plastics, standardizing signage and infrastructure, expanding organics collection) and corporate vehicle fleet. The approach for the 2019 Plan will be a Corporate GHG Reduction Framework that recommends energy efficient building operations standards, and approaches and procedures for embedding energy efficiency across the Corporation.
* We want to include chapters on: street lighting, CHP, energy storage, requirement for new construction (i.e. creating an energy efficiency/conservation checklist for project managers). Opportunity to explore subsidized loan for implementing energy conservation project, etc..
* Policy changes (OP policies relating to new municipal buildings/ green development standards/ upgraded Building Code amendments).

# **Q11 What progress reporting structure is likely to be in the 2019 Plan? Annually, Every two years, at the end of the 4 years?**

|  |  |
| --- | --- |
| Annually | 88% |
| At the End of the Four Years | 8% |
| Quarterly | 4% |

# **Q12 What suggestions might you have for how the 2019 CDM Plans once submitted could be analyzed and reported on to help support your municipality’s CDM implementation?**

* Apart from annual reporting we will work on developing dashboards and have awareness campaigns.
* Clarity of setting targets and timing of targets. Integration with requirements under O. Reg. 588/17.
* Comparators with other similar municipalities
* Free workshops, training seminars or webinars on this topic for staff managing the portfolio.
* Having sustained programs in place for funding is critical to Municipalities due to lead time required to develop projects. When seeking approval for funding and implementing projects within the project timelines (4-5 years minimum). Some programs have very short windows for completion of applications, funding approvals and project implementation and this leads to missed opportunities.
* Possible streamlined approach and more prescriptive format which allows for equitable comparison among municipalities.
* Have the province scan all municipal plans, identify common projects and develop and eligible project funding mechanism that does not involve grant applications.
* Goals/targets should align with any annual reporting already done, so it becomes integral to annual reporting and updates.
* If we could get some feedback on the quality of our proposal and if we hit all of the expectations within the green energy act. Or even if the ministry posted some portions of plans that demonstrated what they were looking for.
* Province could generate awards or recognize best in class CDM plans for small, medium and large size municipalities. Province could generate summary reports of common themes, best practices, innovation and case studies and projects from the 2014 CDM Plans.
* List of proposed measures including cost, savings, and payback (if available)
* Information chapters included in the plan. Information on energy reduction targets set (overall in absolute terms or EUI terms) and targets set for operation types. Streetlights included in the plan? - Demand Response included in the plan? Net metering included in the plan? M&V protocols adopted? Opportunity to explore subsidized loan for implementing energy conservation projects.
* How projects within the CDM can align with other requirements (asset management, long range budget forecast, GHG reporting, etc).
* More accurate Energy Use Intensity (EUI) for various municipal facilities will be useful.

# **Q13 Other questions that you would like to hear from others on?**

* Any cost savings by addressing the Global Adjustment Charge? Existence of green funds/energy funds?
* How to continually engage staff in the topic.
* Challenges, constraints and proposed solutions for dealing with barriers for implementation of CDM initiatives. Corporate approach to CDM whether centralized or decentralized and across operational areas.
* I know that a number of municipalities use LEED as a standard for new buildings and I would be interested to hear if any of these goals will be revised with the update of the new CDM plans. I believe ours will be changing but I'm not sure what the new standard will be.
* 1) Are other municipalities looking beyond facility energy measures, and incorporating corporate GHG reduction strategy as a whole? 2) Will other municipalities be looking to make aggressive commitments to net zero energy/carbon? 3) What are unique financing mechanisms that municipalities will be considering, independent of the Province's support? (i.e. green bonds to invest in deep energy retrofits) 4) Are other municipalities implementing deep energy retrofits to older facilities? 5) When large pieces of equipment are up for replacement, are other municipalities exploring low-carbon options such as biomass versus replacement with a more energy efficient version of the technology? 6) Are there any lessons learned from implementing Fleet related actions and from including other sectors in the Plans beyond facility energy reduction?
* Plan developed in house or contracted out? Sharing Terms of reference to external consultant in developing the plan. M&V protocols adopted
* How many municipalities are completing the plan in house? What department is taking on the lead role of the CDM plan?
* Staff resourcing (how many hours/staff dedicated to plan development). Budget dedicated to project. Discussion on consultants (are people using them? How? What type of scope of work?).

**Q14 Has your municipality undertaken an energy audit to identify energy efficiency potential of municipal facilities**?

|  |  |
| --- | --- |
| Select facilities only | 25% |
| No | 13% |
| Yes | 62% |

# **If you have undertaken an audit would you be able to share the energy savings potential that has been identified (electricity and natural gas savings)?**

If you are able to share how much of that potential has been captured already through retrofits please let us know that as well if you can.

* Energy Audits were conducted for the 2014 Plan.
* In 2013, we had audits done for approximately 15 facilities (including two administrative buildings, community centres, and fire stations). Just the potential savings from the short-term retrofits (less than three year payback) totaled 2,393 MWh of electricity savings, 77,910 m3 of natural gas savings, and annual cost savings of $386,136.
* Yes, we have performed energy audits on 12 facilities within the corporation and we are planning on strategically renewing some of them. The energy audits were performed in 2014 and 2015.
* Yes, we can share audits.
* Yes
* Looking to conduct in-house energy reviews
* Energy site assessments offered through LDCs have been for facilities where appropriate (Level 1.5 equivalent ASHRAE) to determine energy savings opportunities. Through Asset Management, Building Condition Assessments (BCAs) undertaken for all municipally owned facilities on 10 year cycles which identify energy saving opportunities. Additional work plans are being developed for concurrent completion of Level 2 ASHRAE energy audits as part of the BCA undertakings. Most recent set of completed energy audits were for 3 social housing MURBs which were used as part of business case submission for SHAIP program under the cap and trade ($3.8 million committed for completion of retrofits and still moving forward despite cancellation of program).
* We have but quite a while ago and I believe we will start to re-audit buildings or recommission buildings on a rotation, possibly every 5 years.
* Varies by facility - we required a minimum of 5% savings for both electricity and natural gas. For one of our large recreation facilities the electricity savings identified were: 505,116 kWh (including renewable energy opportunities) and for natural gas: 112,268 m3
* Yes, we can share the information with the group.
* Completed in 2014 for all major facilities and plan to undertake again in early 2019.
* We conducted 6 audits that identified potential savings, but these are not worth sharing as the findings are generic and the costing and benefits are limited.

|  |
| --- |
| Municipalities that Completed the Survey |
| King |
| City of London |
| The Town of Whitby |
| City of Vaughan |
| Town of Whitby |
| The Regional Municipality of Peel |
| Region of Waterloo |
| Mississauga |
| Town of Aurora |
| City of Hamilton |
| City of Guelph |
| Regional Municipality of Durham |
| Halton Hills |
| City of Timmins |
| County of Simcoe |
| The City of Burlington |
| Town of Caledon |
| City of Markham |
| Town of Richmond Hill |
| Town of Ajax |
| City of Pickering |
| City of Barrie |
|  |