



Union Water Supply System Inc.

Board of Directors Meeting

Wednesday, June 19th, 2024

9:00 am

Kingsville Arena, 1741 Jasperson

AGENDA

- A. **Call to Order:**
- B. **Welcoming Remarks**
- C. **Disclosures of Pecuniary Interest:**
- D. **Approval of Minutes:**
Minutes of the Board of Directors Meeting held on May 15th, 2024
Pages 3 - 11
- E. **Business Arising Out of the Minutes**
- F. **Items for Consideration:**
 - 1. UWSS/18/24 dated June 14th, 2024
RE: Status Update of UWSS Operations & Maintenance Activities and Capital Works from May 15th to June 14th, 2024
Pages 12 - 14
 - 2. UWSS/19/24 dated June 13th, 2024
RE: Terms of Reference for Finance & Audit Committee and Governance Committee
Pages 15 - 16
 - 3. UWSS/20/24 dated June 13th, 2024
RE: UWSS Inc. Energy Conservation Demand Management (CDM) Plan 2025-2029
Pages 17 - 69
 - 4. UWSS/21/24 dated June 13th, 2024
RE: Update on Service Level Review of UWSS Inc. Contracted Operations and Maintenance Services
Pages 70 - 72

G. Verbal Update

UWSS-Windsor Utilities Commission Water Security Redundancy Study

H. Special Closed Meeting of the UWSS Joint Board of Management**Recommendation:**

That the That the UWSS Inc. Board of Directors move into a Special Closed Meeting, pursuant to the Municipal Act Section 239 (2)(f)(j) for the following reason:

Matters for Consideration:

Legal discussion Under Municipal Act Sections 239 (2)(f)(j) wherein UWSS Inc.'s solicitor will provide (f) advice subject to solicitor-client privilege, including communications necessary for that purpose (j) a trade secret or scientific, technical, commercial or financial information that belongs to the municipality or local board and has monetary value or potential monetary.

- New Financing for Union Water Supply System

I. Disclosure of Pecuniary Interest and General Natural Thereof**J. Adjournment of Special Closed Meeting****K. Report on Closed Session****L. New Business:****M. Action Items:****N. Comments, Announcements, and Other Business:****O. Adjournment:****P. Date of Next Meeting: July 17th, 2024 9:00 am Kingsville Arena**

/kmj



Board of Directors Meeting

Wednesday, May 15, 2024
9:00 am

Kingsville Arena, 1741 Jasperson

MINUTES

Directors Hilda MacDonald (Chair)
 Kim DeYong (Vice Chair)
 Tom Kissner
 Kirk Walstedt
 Dennis Rogers
 Mike St. Amant
 Sebastian Schmoranz
 John Tofflemire
 Wayne Wharram
 Larry Verbeke

Absent Lori Atkinson
 Sherry Bondy
 Tom Kissner

Also in Attendance: Rodney Bouchard, UWSS Inc. Chief Executive Officer
For UWSS Christine Johnson, UWSS Inc. Office Administrator

Guest William Willis, Willis Business Law - UWSS Legal Counsel

OCWA Staff Ken Penney, Dale Dillen, Dave Jubenville

Municipal Staff Laura Rauch - Municipality of Leamington
Present Erica Allen - Town of Kingsville
 Rob Mackie - Town of Essex

Call to Order: 9:02 am

Welcoming Remarks:

The Chair welcomes everyone to the meeting.

Disclosure of Pecuniary Interest: none

Adoption of Board Minutes:**No. UWSS-25-24**

Moved by: Director Rogers

Seconded by: Director St. Amant

That the minutes of the Union Water Supply System Inc. Board of Directors meeting held April 17, 2024 are received.

Carried

Business Arising out of Minutes:

There was none.

Items for Consideration**Report UWSS/13/24 dated May 10th, 2024 re: Status Update of the UWSS Operations & Maintenance Activities and Capital Works from April 12th to May 10th, 2024**

The CEO welcomes everyone. He begins by stating that he will be changing things up a bit with the way he presents some reports. He states that he hopes all members have had an opportunity to review the reports as he will now be pointing out the most important items and then allow members to ask questions.

He then notes a watermain break on May 4th at Road 4 and Division N. in Kingsville. He indicates that residents in the area would have been without water for a time while repairs were being made. The cause is still under investigation.

He notes that interconnects to Amherstburg were opened on May 13th to test pressures and potentially assist Amherstburg while they need to shut down in order to make repairs. The test ran well for eight (8) hours and then pressures were not able to be maintained. Staff from the municipalities is trying to determine a better course of action to assist our neighbours. He reminds members that testing such as this is good to determine viability in case of an emergency, such as that in Wheatley. Dave Jubenville, OCWA Manager, indicates that the MECP wanted this test to determine redundancy in an emergency. The Chair notes that this is why UWSS Inc is conducting the study with Windsor Utilities Commission (WUC).

The CEO confirms that UWSS Inc. is awaiting a response from MECP for our Municipal Class EAS. After a response is received then this project will move to a 30 day comment period, then move into detailed design.

The CEO explains that Deloitte had been retained to conduct a full review of the OCWA contract. This was launched on March 15th, 2024. Various stakeholders and other

municipalities were interviewed as part of the review process. He notes that a report will be shared in June, but the recommendation coming from Deloitte is that UWSS Inc. re-negotiate the contract with OCWA; he notes there are several other recommendations as well to be included as part of the negotiation process.

The CEO then reviews the flows. He explains that the increases are attributed the following: 43% increase due to assisting Wheatley and 44% due to recently discovered large watermain leak on County Rd 34; that leaves the remaining increase at around 2%, which is on track, budgetarily speaking. He notes that a leak detection program is commencing to assist with breaks such as this.

Director Tofflemire asks about the Boil Water Advisory (BWA) currently issued for some areas of Wheatley.

Director St. Amant asks if the water bills would show these breaks better. The CEO notes that Leamington has the capacity to see changes and Kingsville is moving to that with the installation of new water meters. Director DeYong notes that Kingsville is at 60% installation rate of the new meters.

No. UWSS Inc-26-24

Moved by: Director Walstedt

Seconded by: Director DeYong

That report UWSS/13/24 dated May 9th, 2024 re: Status Update of UWSS Operations & Maintenance Activities and Capital Works from April 17th to May 10th, 2024 is received.

Carried

Report UWSS/14/24 dated May 9th, 2024 re: Budget Approval Request - Reservoir Expansion Project Detailed Design, Engineering, Project Management and other Works

The CEO reads the recommendation to the Directors. He reminds them that they are working towards expanding the reservoir capacity by constructing a third reservoir on site. He reminds them that UWSS purchased property in 2022 next to the water treatment plant. He notes that Associated Engineering (AE) originally recommended a 40 ML reservoir to meet needs. However, the hydrogeological studies determined the soil conditions would make a 40 ML reservoir very expensive.

After a workshop to discuss the options, it was then determined that a 20 ML reservoir would be better suited on the site and at the same time the engineers will be considering the DAF #2 and the High Lift upgrades. Looking at everything together to have some cost saving benefits. The greenhouse on site will be removed shortly and the hope is that the reservoir project can start in the Fall.

The CEO reviews the pricing within his report. Director Rogers asks if it might be more cost effective to build the larger reservoir now, as costs keep going up. The CEO notes

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that the soil conditions will determine if another reservoir can be placed on the site, or should another location be considered, such as out at the CBS.

The timeline is then discussed, and the CEO is hoping for 18 months build time, however, 24 months is more realistic. Director Verbeke asks if the construction will be through our property and whether we are still going to be a landlord during this phase. The CEO notes that the construction will be through UWSS Inc owned property and yes, still a landlord until the reservoir is constructed and then the house and shop on property are severed for future sale.

The Chair then reads the recommendation again, so everyone is clear on the \$1 million budget.

No. UWSS-27-24

Moved by: Director Tofflemire

Seconded by: Director Schmoranz

That the Union Water Supply System Inc. (UWSS Inc.) Board of Directors receives this report for information;

And further, that the UWSS Inc. Board approves a budget of \$1 million for work associated with detailed design, engineering & project management, greenhouse demolition, supplemental geotechnical and hydrogeological investigations, etc. for the reservoir expansion project at the 1529 Union Avenue property in Ruthven, Ontario.

Carried

Report UWSS/15/24 dated May 9th, 2024 re: Update on Request for Proposal for Construction Management Advisor to Support UWSS Capital Works Program

The CEO reminds members of this item and the journey to get to this point. He advises that this was posted on MERX in February. He confirms that this was a two (2) envelope process and he reviews the candidates and their pricing.

The Chair notes that there is a large discrepancy between the pricing of the three (3) contenders and going with the lowest bid is not always necessarily the best for the situation. The CEO also was also initially concerned with the low bid, however, in consultation with the engineer, AE, they are confident that the chosen firm, even though the low bid, is the best option to complete this work.

Director Rogers also expresses concern by going with the significantly lower bid. Several other directors also express the same concern.

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The CEO explains that looking at the technical score really does put the 3 contenders on even ground. Director St. Amant likes that Amico is involved and asks that if this does not work out, we can reconsider.

No. UWSS-28-24

Moved by: Director DeYong

Seconded by: Director St. Amant

That the Union Water Supply System Inc. (UWSS Inc.) Board of Directors receives this report UWSS/15/24 for information.

Carried (UWSS/15/24)

Report UWSS/16/24 dated May 9, 2024 re: Award of Conceptual & Detailed Design and Engineering Services - Dissolved Air Flotation (DAF) Retrofit of Clarifier #4

The CEO reminds the Directors that this project is moving forward and the budget had been approved during the budget process earlier in the year. He confirms that the team of AE and Napier-Reid learned a lot from DAF #1 and the first step in this process will be a workshop to discuss lessons learned and the best way to incorporate those lessons.

The CEO reviews the tasks and the financial impact. He also notes that Clarifier #4 will not be taken out of service until the lower flows occur, normally end of summer or early Fall.

No. UWSS-29-24

Moved by: Director Verbeke

Seconded by: Director Walstedt

That the Union Water Supply System Inc. (UWSS Inc.) Board of Directors receives this report UWSS/16/24 for information.

Carried (UWSS/16/24)

Report UWSS/17/24 dated May 10, 2024 re: Revised Terms of Reference for Finance & Audit Committee and Governance Committee

The CEO advises that the comments received at the February and April meetings have been incorporated into the Terms of Reference. He reviews amendments made, specifically regarding a line item for staff to be added.

Director DeYong is concerned that the new Terms of Reference do not clarify the difference between non-voting member and non-voting observer. Legal representative,

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William Willis, explains that municipal staff do not want to be considered as part of these committees.

Director DeYong feels that several times now the Directors have asked for clarification on non-voting members and direction is not being followed. She feels that municipal staff should be included to participate in committee meetings as well as in camera sessions, so their expert opinions can be shared and understood.

William Willis explains that there needs to be caution used as there is a distinction within the Shareholders Agreement that staff members are not specifically part of the committees or we risk losing Governance Business Entity (GBE) status. Mr. Willis suggests that this be confirmed through additional consultation.

No. UWSS-30-24

Moved by: Director St. Amant

Seconded by: Director DeYong

That the CEO, in conjunction with legal counsel, is directed to more clearly define non-voting members and non-voting observers for the UWSS Inc. Finance and Audit Committee and UWSS Inc Governance Committee; clarify whether these non-voting members should be allowed in camera; clarify whether CAO or designate are advisors to the committees in their capacity as municipal staff; clarify that CAO or designate is the same as the CEO of UWSS and Capital Assist, who are also advisors on the said committees.

Carried

Director DeYong leaves the meeting at 10:28 am

Verbal Update:

The CEO provides a verbal update on the UWSS Inc. and WUC emergency redundancy study. He briefly outlines the accomplishments so far with this study. He explains that 3 Technical Memorandums have been created and reviewed. He notes that it has been determined to create a split reservoir, shared between both UWSS and WUC.

He notes that the next step would be moving to the Environmental Assessment (EA) stage. However, both WUC and UWSS Inc feel it might be best to have a joint meeting with both boards to review this project prior to moving any further forward.

The CEO suggests that perhaps a steering committee is formed and perhaps an independent financial consultant should review this project. This would also be an opportune time to identify any grant funding and division of costs.

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The Chair recommends that the CEO send along the original report that members of the Joint Board of Management reviewed and approved.

Director Verbeke asks the CEO why this is coming before the board again, since all of the budget has not been used up. The CEO notes that it had previously been approved at the Joint Board of Management and now it needs to be brought over to the Board of Directors.

Director Tofflemire discusses the size of the reservoir and whether that is enough. The CEO explains that 7 ML is the bare minimum required by WUC. He notes that this may be a situation where other municipal players can be brought in and therefore the size can change.

The CEO then provides an update on the Sun Life's Long-Term debt. He reminds the Directors that he was directed to pay of the debt as soon as possible, which is a few years sooner than anticipated. He is hoping that by May 24th the debt will be paid off. Part of the agreement to pay off early saves several hundred thousand dollars for UWSS Inc.

No. UWSS-31-24

Moved by: Director Rogers

Seconded by: Director Verbeke

That the verbal updates provided are received as information

Carried

Special Closed Meeting of the UWSS Joint Board of Management

Time: 10:48 am into closed session

No. C-UWSS Inc -03-24

Moved by: Director Wharram

Seconded by: Director Tofflemire

That the That the UWSS Inc. Board of Directors move into a Special Closed Meeting, pursuant to the Municipal Act Section 239 (2)(f)(j) for the following reason:

Matters for Consideration:

Legal discussion Under Municipal Act Sections 239 (2)(f)(j) wherein UWSS Inc.'s solicitor will provide (f) advice subject to solicitor-client privilege, including communications necessary for that purpose (j) a trade secret or scientific, technical, commercial or financial information that belongs to the municipality or local board and has monetary value or potential monetary.

-
- New Financing for Union Water Supply System

Disclosures of Pecuniary Interest and General Nature Thereof

There was none.

The CEO provides the members with a verbal update on the financing proposals from institutions to fund UWSS Inc. capital works program. Legal counsel provides his opinions on the matter and notes that the terms are favourable for UWSS Inc. and sees no concerns.

Director Rogers suggests the CEO and legal counsel consider some other options and provides a few suggestions. He explains that he would like a comparison for the Board.

Director St. Amant suggests that the finance committee have a review of the new financing for the UWSS Inc.

Adjournment of Special Closed Meeting

No. C-UWSS Inc.-04-24

Moved by: Director Schmoranz

Seconded by: Director Tofflemire

That the UWSS Inc. Board of Directors moves out of closed session.

Report on Closed Session

UWSS Inc. Board of Directors entered into closed session under the Municipal Act section 239 subsection 2, and parts (f) and (J) for the purposes of advice under solicitor-client privilege, and regarding financial information. The CEO of UWSS Inc. received directions from the Directors of the Board in reference to the New Capital Financing for UWSS Inc.

No. UWSS-32-24

Moved by: Director Walstedt

Seconded by: Director Schmoranz

That the UWSS Inc. Board of Directors direct the CEO to confirm the terms from the lending institution for the \$60 million credit facility proposal that is currently under review;

And that the CEO provide a comparison of the finance rates between the lending institution's proposal and Infrastructure Ontario;

Carried

New Business:

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Director St. Amant asks that the members of the finance committee remain after the regular meeting in order to determine a chair for said committee.

A small discussion on dates for the joint board meetings between WUC and UWSS Inc.

Comments, Announcements, and Other Business

There was none.

Adjournment:

No. UWSS-33-24

Moved by: Director Schmoranz

Seconded by: Director Rogers

Time adjourned: 10:07 am

Date of Next Meeting: June 19th, 2024, Kingsville Arena - 9:00 am.

/kmj

To: UWSS Inc. Board of Directors
From: Rodney Bouchard, UWSS Inc. CEO
Date: June 14, 2024
Re: Status Update of UWSS Operations & Maintenance
Activities and Capital Works from May 15 to June 14, 2024



Purpose:

To inform the UWSS Inc. Board of Directors about operational and maintenance activities and capital works projects for the Union Water Supply System since the last Board meeting on May 15, 2024.

Discussion:

UWSS management conducts regular meetings with OCWA Operations staff regarding on-going operations and maintenance programs for the UWSS facilities. The following provides an update on UWSS operations, regular maintenance and major maintenance and Capital Works at UWSS facilities:

1. May 15th - Maintenance staff installed a new electric actuator influent valve for Filter #5. This work was completed as part of filter valve upgrades to convert from air actuated valves to electrical actuated valves.
2. May 22nd - High Lift pump #2 motor repairs are complete. The pump is back in service. This pump had been out of service since February 2024.
3. May 23rd - A third party service provider, Flowmetrix, completed the annual verification of the UWSS master flow meters.
4. May 27th - Allsop Plumbing was on-site to complete backflow preventer inspections.
5. May 30th - Interconnects between UWSS and Harrow-Colchester system were opened in early afternoon as a result of emergency repairs to the Colchester water treatment plant that required shut-down of the plant. The interconnects were closed in early afternoon of May 31st after completion of the repairs.
6. June 5th - DiMenna Excavating was retained to complete the clean-out of the south residuals lagoon at the UWSS treatment plant. This work is expected to take approximately 2 weeks, weather depending.
7. June 6th - An internal inspection on Surge tank #2 was completed by PW Makar. Initial inspection didn't identify any major issues. An inspection report is expected before the end of June.
8. June 9th - OCWA maintenance staff isolated the Kingsville water tower and started the draining process to allow the installation of a new cathodic

Re: UWSS/18/24 - Status Update of UWSS Operations & Maintenance Activities and Capital Works from May 15 to June 14, 2024

- protection system. Corpro Canada was retained to supply and install the new system. The work was completed on June 12th. OCWA operations/maintenance staff began the refilling/disinfection process on June 13th. It is anticipated that the water tower will be returned to service on June 19th.
9. A New check valve was installed on Cottam Booster #3 as part of the upgrades to the pumping program for Cottam Booster. The pump is expected to be tested by June 14th upon completion of the disinfection process.
 10. The new Quench Buggy is ready for use at events in Leamington, Kingsville, Essex, and Lakeshore. UWSS and OCWA staff are working with municipal staff to accommodate use of the Quench Buggy at events. The first use of the Quench Buggy was at an event in Leamington on June 7th, 2024.
 11. UWSS Inc. administration has retained Digital Water Solutions (DWS) to install leak detection monitoring along the 300mm watermain between Hwy 3 and Cottam Booster. The system will include smart hydrant monitoring devices with pressure and acoustics monitoring and similar devices within at least one chamber on this route. UWSS is working with Town of Kingsville staff for the upgrade of hydrants to allow the installation of the system. It is anticipated that deployment of the system will start in late July 2024.
 12. On May 31st, UWSS Inc. administration received comments from the Ontario Ministry of Environment, Conservation and Parks (MECP) regarding the Municipal Class Environmental Assessment Study (EAS) for increased treatment plant capacity for the Union Water Supply System. UWSS' consultant, Associated Engineering, is revising the report to address the comments and will also prepare a response to MECP. The MECP comments are mostly administration or general with some additional information being requested. The response and updated report is expected to be submitted to the MECP on June 18th, 2024.

The first chart shows comparative flows for 2020 through 2024 in Mega Litres (ML) and the second chart shows Millions of Imperial Gallons (MIG) for the period January 1st to June 13th, 2024.

	2020	2021	2022	2023	2024
Flow to Date (ML)	7,520.26	8,611.31	8,369.05	9,266.32	9,967.85
Max Day (ML)	85.45	93.83	92.14	108.68	94.48
Min Day (ML)	25.44	26.74	27.58	32.48	33.68
Average Day (ML)	45.58	52.51	51.03	56.50	60.41
No of Days	165	164	164	164	165

Re: UWSS/18/24 - Status Update of UWSS Operations & Maintenance Activities and Capital Works from May 15 to June 14, 2024

	2020	2021	2022	2023	2024
Flow to Date (MG)	1654.26	1894.26	1841.64	2038.34	2192.65
Max Day (MGD)	18.80	20.64	20.27	23.91	20.78
Min Day (MGD)	5.60	5.88	6.07	7.14	7.41
Average Day (MGD)	10.03	11.55	11.23	12.43	13.29
No of Days	165	164	164	164	165

Flows to date are up 701.53 ML (154.31 MIG) or 7.5% from last year. The 2024 flows to date are up 18.1% over the previous 4-year average.

Recommendation:

That this report be received by the UWSS Board for information purposes.

Respectfully submitted,



Rodney Bouchard, CEO
Union Water Supply System Inc.

/kmj

To: UWSS Inc. Board of Directors
From: Rodney Bouchard, UWSS Inc. CEO
Date: June 13, 2024
Re: Updated Terms of Reference for Finance & Audit
Committee and Governance Committee



Recommendation:

It is recommended that the Union Water Supply System Inc. (UWSS Inc.) Board of Directors receives this report and the referenced legal counsel document “**Re: Terms of Reference for the Finance and Audit and Governance Committees, dated June 5th, 2024**”, and

That the UWSS Inc. Board adopts the following updated Terms of Reference documents:

- Terms of Reference for the UWSS Inc. Finance & Audit Committee (updated June 5, 2024)
- Terms of Reference for the UWSS Inc. Governance Committee (updated June 5, 2024)

Background:

At the May 15th, 2024 meeting of the UWSS Inc. Board of Directors, the Board expressed concerns regarding the wording in the Terms of Reference for the Finance and Audit Committee to “voting members”, “non-voting members” and “non-voting observers”. The Board also and expressed concerns regarding the omission of municipal staff representatives from the Terms of Reference for the Governance Committee. UWSS Inc. Administration was directed by the Board to revise the documents to address these items.

Discussion:

UWSS Inc. administration consulted with retained legal counsel, Willis Business Law, to revise both terms of reference documents to address the comments and concerns raised by the Board at the May 15th meeting. Legal counsel prepared a Memorandum “**Re: Terms of Reference for the Finance and Audit and Governance Committees, dated June 5th, 2024**” to identify the revisions made to these documents by UWSS Inc. Administration and legal counsel. These revisions include the following:

Re: UWSS/19/24 - Updated Terms of Reference for Finance & Audit Committee
and Governance Committee

Terms of Reference for the Finance & Audit Committee

- Define the term “member” to better distinguish between voting “members” and non-voting “advisors” entitled to attend committee meetings.
- Clarify that each municipal shareholder is entitled to have a representative at the committee meetings, being either the CAO or their designate.
- Clarify that the CAO or their designate are advisors to the Board in their capacity as municipal staff.
- Clarify that the role of the CAO or their designate is the same as the CEO of UWSS, and Capital Assist who are also advisors to the Board, *ex officio*.

Terms of Reference for the Governance Committee

- Define the term “member” to better distinguish between voting “members” and non-voting “advisors” entitled to attend committee meetings.
- Clarify that each municipal shareholder is entitled to have a representative at the committee meetings, being either the CAO or their designate;
- Clarify that the CAO or their designate are advisors to the Board in their capacity as municipal staff.
- Clarify that the role of the CAO or their designate is the same as the CEO of UWSS, who is also an advisor to the Board, *ex officio*.

The revised terms of reference documents for the Finance & Audit Committee and Governance Committee were appended to legal counsel’s June 5th, 2024 Memorandum. UWSS Inc. administration provided a copy of the Memorandum and appended documents via email correspondence dated June 10th, 2024.

Comment

It is UWSS Inc. administration’s position that the Terms of Reference documents for the Finance & Audit Committee and Governance Committee have been revised satisfactorily for adoption by the UWSS Inc. Board.

Respectfully submitted,



Rodney Bouchard, CEO
Union Water Supply System Inc.

/kmj\

UWSS/20/24

To: UWSS Inc. Board of Directors
From: Rodney Bouchard, UWSS Inc. CEO
Date: June 13, 2024
Re: UWSS Inc. Energy Conservation Demand Management (CDM) Plan 2025-2029



Recommendation

That the Union Water Supply System Inc. Board of Directors (Board) receives report UWSS/20/24 *UWSS Inc. Energy Conservation Demand Management (CDM) Plan 2025-2029* for information purposes; and

That the Board endorses in principle the goals of the draft *Union Water Supply System Inc. Energy Conservation and Demand Management Plan 2025-2029, June 1, 2024* prepared by the Ontario Clean Water Agency (OCWA) for the Union Water Supply System.

Background:

In 2014, the Union Water Supply System (UWSS), with support from the Ontario Clean Water Agency (OCWA) developed a comprehensive Five-Year Conservation and Demand Management (CDM) Plan for the system in compliance with the requirements of *Ontario Regulation 397/11* under the *Green Energy Act, 2009*. This initial CDM Plan was received and endorsed by the UWSS Joint Board of Management (UWSS JBM) at the July 2015 Board meeting.

In 2018, *Ontario Regulation 397/11* under the *Green Energy Act, 2009* was replaced with *Ontario Regulation 507/18* under the *Electricity Act, 1998*. Under *Ontario Regulation 507/18*, all Broader Public Sector Organizations including municipalities, service boards and townships, are required to report annually on energy use and greenhouse gas (GHG) emissions. The organizations are also required to develop a CDM plan and update it every five years, with this first update due July 1, 2019.

In 2019, UWSS completed an update to the UWSS CDM Plan as required by regulation. The updated plan was prepared with support by OCWA. The UWSS JBM received and endorsed the 2019 CDM Plan update at the June 19th, 2019 Board meeting.

Discussion:

The UWSS retained OCWA to complete an update the UWSS CDM Plan that was originally developed in 2014 and then updated in 2019. The CDM update builds on these previous versions and incorporates the experiences gained in energy conservation over the last 10 years. This updated CDM plan was developed as per the regulation and guidelines provided by Ministry of Energy, Northern Development and Mines and covers the period from 2025 to 2029.

Re: UWSS/20/24 - UWSS Inc. CDM Plan 2025-2029

As required by *Ontario Regulation 507/18* under the *Electricity Act, 1998* the UWSS has been submitting its annual energy usage (electricity and natural) to the Ontario Ministry of Energy, Northern Development and Mines via the Ministry's online reporting "portal". This information is also posted on the UWSS website www.unionwater.ca for public information purposes.

It should be noted that Joint Municipal Services Corporation under Ontario Regulation 599/06, such as UWSS Inc., are not identified as Broader Public Sector (BPS) organizations in the Electricity Act - Ontario Regulation 25/23. However, UWSS Inc. is an organization that delivers a municipal service on behalf of its four municipal shareholders. Thus, it was deemed by UWSS Inc. administration that it would be in the best interests of UWSS Inc.'s stakeholders and shareholders to prepare an update to the UWSS CDM plan for review and endorsement by the UWSS Inc. Board.

Upon the UWSS Inc. Board's endorsement of the UWSS Inc. CDM Plan for 2025-2029, the plan will be submitted to the Ministry of Energy, Northern Development and Mines by the July 2024 deadline. The CDM plan will also posted on the UWSS website for public information.

The UWSS CDM plan is to be treated as a living document and will be reviewed each year to account for annual capital and operational improvements at UWSS facilities.

Conclusion

It should be noted that energy reduction in drinking water treatment and pumping facilities is not a simple endeavour since energy consumption at such facilities is linked to water consumption. As water demand increases, such as on hot and sunny summer days, more electricity is needed to treat and pump the water. Further, increased water demands typically occur during the hottest part of the day, which also usually coincides with peak electricity rates. However, UWSS Inc. administration is of the opinion that the UWSS Inc. CDM Plan for 2025-2029 demonstrates that the UWSS is making all necessary efforts to reduce its overall energy consumption thus meeting or exceeding the regulatory requirements while also embodying the spirit of energy conservation.

Respectfully submitted,



Rodney Bouchard, CEO
Union Water Supply System Inc.

/kmj



Energy Conservation and Demand Management Plan

2025-2029

June 1, 2024

Union Water Supply System, Inc.

Table of Revisions

Revision #	Date	Description of Revision	Revised by
0	June 16, 2015	Initial Issue	UWSS and OCWA
1	June 26, 2019	5-Year Revision	UWSS and OCWA
2	June 1, 2024	5-Year Revision	UWSS and OCWA



June 1, 2024

Ministry of Energy
159 Cedar Street
Sudbury, ON P3E 6A5

Dear Sir/Madam:

**RE: Union Water Supply System Inc.
Conservation and Demand Management Plan 5-Year Update
Electricity Act - Ontario Regulation 25/23**

The attached Updated Conservation and Demand Management Plan (CDM Plan) has been prepared by the Ontario Clean Water Agency on behalf of Union Water Supply System Inc. (UWSS Inc.). The attached CDM Plan is the UWSS' 5-year update to the initial plan submitted in accordance with the since-revoked Green Energy Act, as required by Ontario Regulation 25/23. The Plan outlines the UWSS' annual energy consumption along with the goals, objectives and proposed measures with respect to energy conservation and demand management. It also outlines the energy reductions achieved from 2014-2022.

UWSS Inc. is committed to implementing the energy conservation and demand management measures as outlined in this Plan, which has been approved by senior management. This Plan is constantly evolving and may be revised to reflect the most current information and circumstances.

I trust the information contained in the Plan is self-explanatory. If you have any questions or require more information, please do not hesitate to call me.

Sincerely,

Rodney R. Bouchard,
General Manager & CEO
Union Water Supply System Inc.

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Schedule 1: Actual 2014-2022 Energy Consumption and Energy Intensities

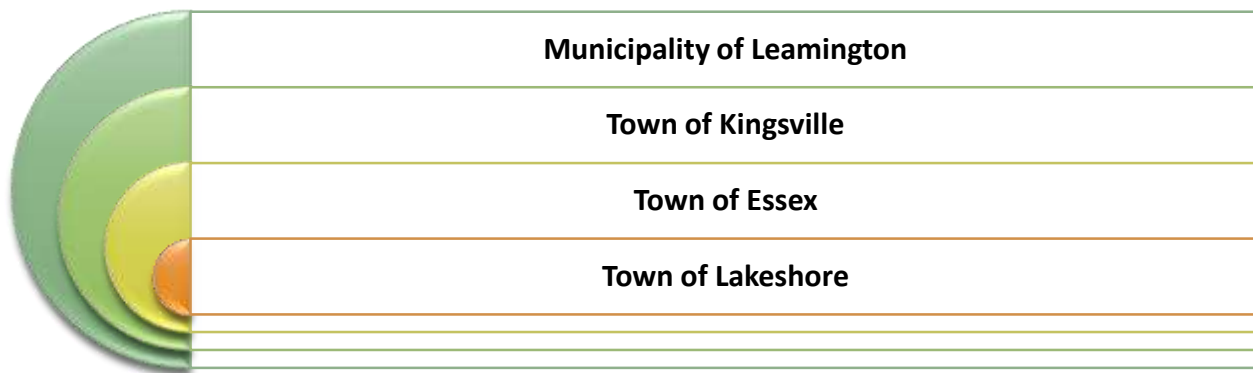
Schedule 2: Board Resolution Adopting 2024 CDM Plan Update

Disclaimer: This document has been prepared by the Ontario Clean Water Agency on behalf of the Union Water Supply System in accordance with Ontario Regulation 25/23 under the Electricity Act, 1998 for submission to the Ministry of Energy, Northern Development and Mines. This Plan is constantly evolving and may be revised to reflect the most current information and circumstances. The Union Water Supply System, its Management Board, shareholders or representatives do not accept any liability whatsoever by reason of, or in connection with, any information in this document or any actual or purported reliance on it by any person. The Union Water Supply System may update any information in this document at any time.

Executive Summary

In 2014, the Union Water Supply System developed a comprehensive Five Year Conservation and Demand Management (CDM) Plan for the system in compliance with the requirements of *Ontario Regulation 397/11* under the *Green Energy Act, 2009* with the support of the Ontario Clean Water Agency (OCWA). This regulation was replaced with *Ontario Regulation 507/18* under the *Electricity Act, 1998* in 2018. The *Regulation 507/18* was replaced with *Regulation 25/23* subsequently in 2023.

Union Water Supply System (UWSS) was incorporated as a Municipal Services Corporation in February 2023 and ownership and management of UWSS was transferred to Union Water Supply System Inc. (UWSS Inc.) on January 1, 2024. UWSS Inc. is overseen by a Board of Directors that are appointed by the following four shareholder municipalities:



UWSS provides treated drinking water to end-user customers in the above mentioned municipalities through a transmission and distribution system network and components (pumping stations and water towers). Local distribution of water to the customers is through municipal distribution systems owned by the four municipalities. Customers are billed for UWSS Inc. Treatment and Transmission rates and local municipal distribution rates. The UWSS water system is operated and maintained by the OCWA under contract with UWSS Inc.

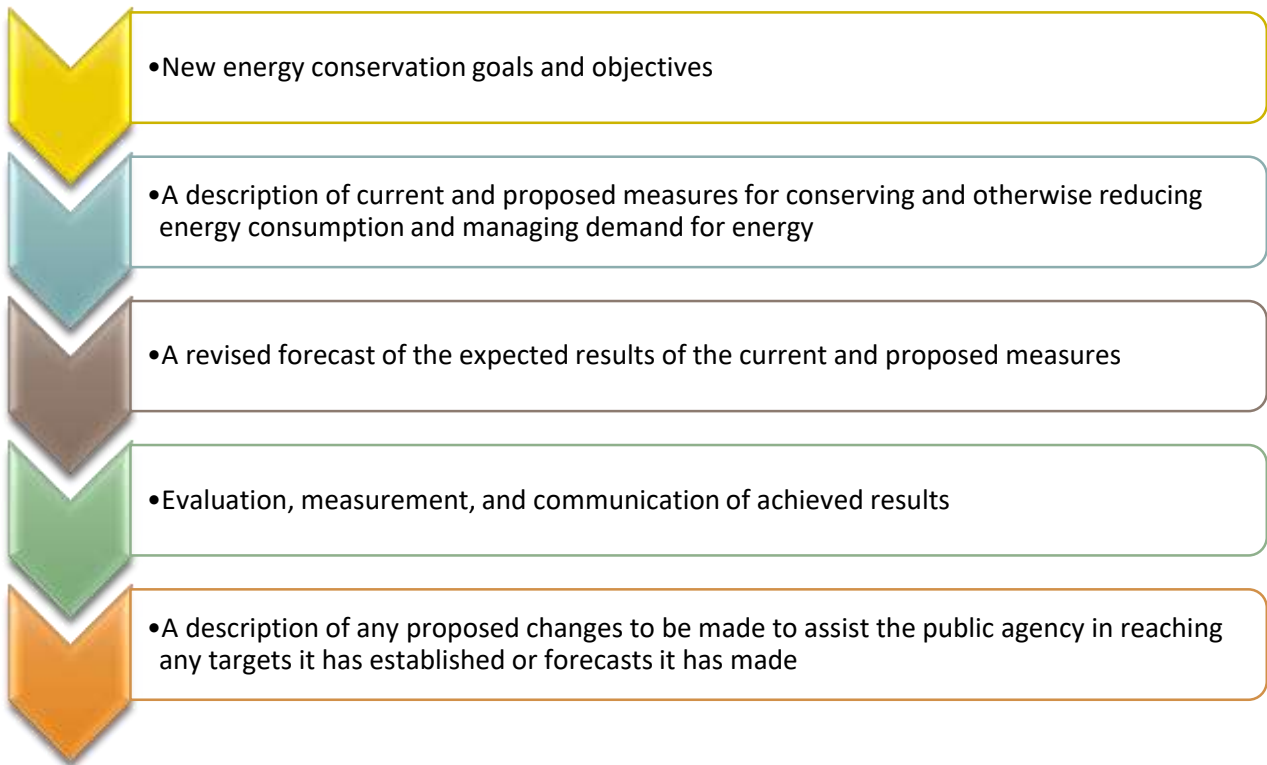
UWSS Inc. retained OCWA to build on the system's first CDM Plan originally developed in 2014 incorporating the experiences gained in energy conservation over the last five years. This updated CDM plan was developed as per the regulation and guidelines provided by Ministry of Energy, Northern Development and Mines and covers the period from 2025 to 2029. The plan was presented to the Management Board and **approved on June 19, 2024**.

There are significant advantages to developing and implementing a CDM Plan. The lowest cost options for meeting energy demands could be to implement energy efficiency and the wise use of energy. Simple actions of turning off lights and appliances, shutting off heaters in the summer and establishing

efficient usage times, efficient production requirement, and many other *actions can result in energy savings, while providing many other environmental, economic and social benefits, including reducing GHG emissions*. Reducing energy consumption translates to reducing costs to municipalities and the savings could be directed to more important works in the municipalities.

The intent of the CDM Plan is to guide UWSS Inc. in the development of an energy management foundation and energy program. It is a living document that will evolve as the UWSS’ energy needs are revealed and better understood. This plan is designed to meet the current energy conservation needs of UWSS.

The CDM Plan should be consistent with other existing planning documents that relate to energy conservation. This plan should also document all energy conservation initiatives that UWSS has completed, currently have and plan to implement. The updated CDM Plan will outline the following:

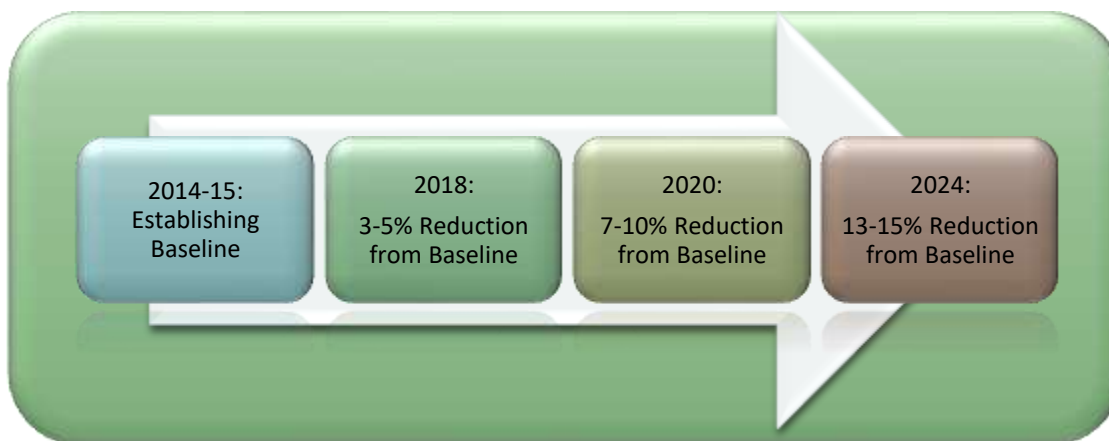


UWSS is committed to the promotion of responsible energy management through the implementation of economically viable energy efficiencies and environmental care throughout all facilities, plants and equipment. UWSS will take reasonable efforts to minimize impacts to the environment when allocating resources, while recognizing the needs of our residents and visitors.

UWSS will exercise stewardship in the use of finite resources to demonstrate leadership, optimize our delivery of services, and enhance the overall quality of life in the community. We will strive to continually reduce our total energy consumption and associated carbon footprint through wise and efficient use of energy and resources.

It was not expected that there would be substantial (>15%) energy usage reductions from the 2014 baseline year's rate of energy consumption. However, there are always opportunities for improvement and UWSS is committed to continuously monitor energy consumption and implement energy efficient practices where applicable.

As a target for the last five year CDM Plan, UWSS vowed to strive to reduce energy (electricity and natural gas) consumption in each building by 13-15% by the end of 2024 from the 2014 baseline.



UWSS has always been proactive towards energy conservation and has initiative various activities that would assist towards efficient use of energy. Overall electricity and natural gas consumption per megalitre of water treated and pumped decreased by 2.6% and 35.2%, respectively in 2022 compared to the 2014 baseline consumption levels. UWSS is committed to continuous implementation of new ECMs and decrease energy consumption, cost and the negative impact of fossil fuels on the environment have raised interest in sustainability and predictable energy rates.

Though total annual electricity and natural gas consumption may have increased at some of the facilities over the years, ***the quantity of electricity and natural gas consumed per unit of flow (energy intensity) demonstrate that the facilities' energy intensities (kWh per ML) have been reduced by over 2.6% for Electricity and 35.2% for Natural Gas since 2014. That said, the 2024 Energy Reduction Target has been surpassed for natural gas, but historically high water demand has caused the water plant to increase consumption of electricity.***

Please see Schedule 1 for a detailed analysis of UWSS' energy consumption and intensities from 2011 to 2022.

UWSS is continuously working to recognize and implement measures to ensure energy savings continue to grow and that new conservation measures are identified and acted upon. Concerns over ever-increasing energy prices and the negative impact of fossil fuels on the environment have raised interest in sustainability and predictable energy rates.

Energy conservation has been an on-going process in all buildings. As per the Capital Budgeting Plans of the UWSS, new developments and redevelopments including replacement/retrofit works are encouraged to be built and sustained in a manner that minimizes energy consumption. Electrical equipment replacement works over the years have been evaluated against energy efficiencies criteria, and the most cost-effective option at that time was chosen.

UWSS will thus strive to ***reduce our energy consumption per unit of water produced (electricity and natural gas) by 3-5% by the end of 2029 from the 2014 baseline***. This Energy Reduction Target will apply to all facilities owned by the UWSS.

UWSS commits to the following objectives for the 2025-2029 period:

- 1 • Improve UWSS' understanding of energy consumption.
- 2 • Increase staff awareness and motivate staff to use energy more efficiently.
- 3 • Report energy performance changes and improvements annually.
- 4 • Improve the efficiency of energy use through low-cost opportunities by implementing the following:
 - Sound operating and maintenance practices;
 - Employee training, and staff awareness;
 - Monitoring and tracking system; and
 - Energy Demand Management program.

Included herein are the measures that will be undertaken to support the achievement of these objectives and goals.

Introduction and Background

In 2014, Union Water Supply System (UWSS) developed a comprehensive Five Year Conservation and Demand Management (CDM) Plan for the system in compliance with the requirements of *Ontario Regulation 397/11* under the *Green Energy Act, 2009* with the support of the Ontario Clean Water Agency (OCWA). This regulation was replaced with *Ontario Regulation 507/18* under the *Electricity Act, 1998* in 2018. Regulation 507/18 was replaced with *Regulation 25/23* in 2023.

Under *Ontario Regulation 25/23*, the requirements for broader public sector energy planning and reporting are identical to those under the former *Ontario Regulations 507/18 & 397/11*.

Under *Ontario Regulation 25/23*, all BPS organizations, including municipalities, service boards and townships, are required to report annually on energy use and greenhouse gas (GHG) emissions. The organizations are also required to develop a CDM plan and update it every five years, with this first update due July 1, 2019.

Regulation 25/23 requires public agencies to:

- Report annually on energy use and GHG emissions.
- Develop five-year energy CDM plans starting July 1, 2014 with the first update due July 1, 2019, and subsequent updated every 5 years.
- Post annual reports and 5-year plans to the agency's website and make printed versions available for the public.

UWSS retained OCWA to build on the system's first CDM Plan originally developed in 2014 incorporating the experiences gained in energy conservation over the last five years. This updated CDM plan was developed as per the regulation and guidelines provided by Ministry of Energy, Northern Development and Mines and covers the period from 2020 to 2024. The 2019 CDM plan update was endorsed by the UWSS Board meeting on June 19, 2019.

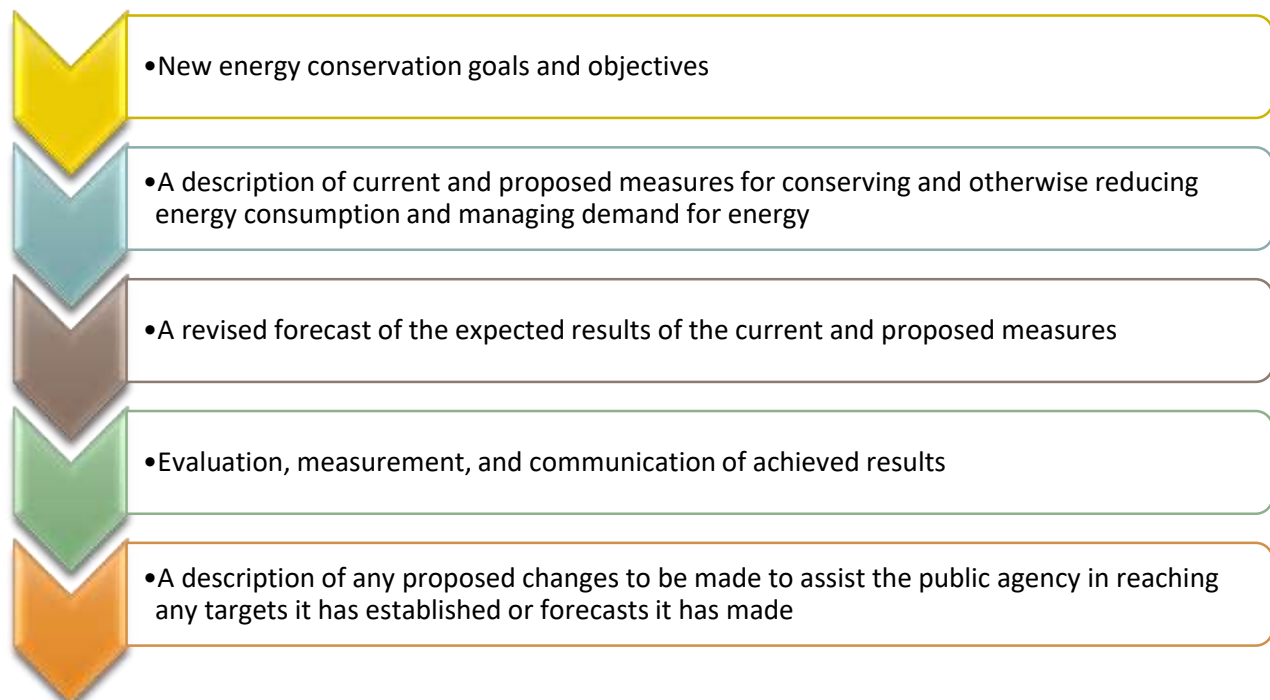
Plan Purpose

Municipalities are under a huge pressure to increase water rates to maintain their water systems and to address increasing energy costs to operate these plants.

There are significant advantages to developing and implementing a CDM Plan. The lowest cost options for meeting energy demands could be to implement energy efficiency and the wise use of energy. Simple actions of turning off lights and appliances, shutting off heaters in the summer and establishing efficient usage times, efficient production requirement, and many other **actions can result in energy savings, while providing many other environmental, economic and social benefits, including reducing GHG emissions.** Reducing energy consumption translates to reducing costs to municipalities and the savings could be directed to more important works in the municipalities.


The intent of the CDM Plan is to guide UWSS Inc. in the development of an energy management foundation and energy program. It is a living document that will evolve as the UWSS' energy needs are revealed and better understood. This plan is designed to meet the current energy conservation needs of UWSS.

The CDM Plan should be consistent with other existing planning documents that relate to energy conservation. This plan should also document all energy conservation initiatives that UWSS has completed, currently have and plan to implement. The updated CDM Plan will outline the following:



Union Water Supply System

Union Water Supply System (UWSS) was incorporated as a Municipal Services Corporation in February 2023 and ownership and management of UWSS was transferred to Union Water Supply System Inc. (UWSS Inc.) on January 1, 2024. UWSS Inc. is overseen by a Board of Directors that are appointed by the following four shareholder municipalities:



Municipality of Leamington
Town of Kingsville
Town of Essex
Town of Lakeshore

UWSS provides treated drinking water to end-user customers in the above mentioned municipalities through a transmission and distribution system network and components (pumping stations and water towers). Local distribution of water to the customers is through municipal distribution systems owned by the four municipalities. Customers are billed for UWSS Inc. Treatment and Transmission rates and local municipal distribution rates. The water system is operated and maintained by the OCWA under contract with UWSS Inc.

The UWSS was originally built in the 1960s and is classified as a Class 4 Water Distribution and Class 4 Water Treatment System. The Ruthven Water Treatment Plant has a capacity of 124,560 m³/day. The Low Lift raw water pumping station includes a three intake system that has a design capacity of 218,208 m³/day and has zebra mussel control systems for intake 1 and 2. Intake 3 is an emergency intake. Water is drawn from the lake through the intake system to the low lift pump station and pumped to the Ruthven Water Treatment Plant (RWTP), where the water is treated. The water storage and transmission system includes two reservoirs at the RWTP, four elevated storage tanks (Albuna Water Tower, Leamington Water Tower, Kingsville Water Tower and Essex Water Tower), one booster pumping station with reservoir (Cottam Booster Station) and approximately 120 km of “transmission” water mains.

The Low Lift (LL) pumping plant building consists of two inlet chambers, screening facilities (two bar screens and four travelling screens), two low lift pump wells, seven vertical turbine pumps, chemical storage and feed facilities, two surge tanks, and 600 kW diesel generator. The two surge

tanks interconnected to the low pump discharge header. The main floor area of the building is approximately 407 m².

The RWTP has a main floor area of approximately 2,580 m², which houses filters, chemical storage and feed equipment, high lift pumps, standby diesel generators, offices, laboratory, control room and workshop.

The Cottam Reservoir and Booster Pumping Station (CBS) is located in the Hamlet of Cottam within the Town of Kingsville. It consists of a two compartment in-ground concrete storage reservoir, a reservoir contact chamber, four vertical turbine pumps, two hydro-pneumatic surge suppression tanks, disinfection system (one sodium hypochlorite tank, two chemical metering pumps and one sample pump), two chlorine residual analyzers, one wastewater holding tank and one 400 kW diesel generator. It also contains an office and washroom.

The Leamington Water Tower is located in the Municipality of Leamington. Its useable volume is 1,514 m³. The Kingsville Water Tower is located in the Town of Kingsville. Its useable volume is 1,137 m³. The Essex Water Tower is located in the Town of Essex. Its useable volume is 1,137 m³. The Albuna Water Tower is located in the Town of Kingsville adjacent the western municipal boundary of the Town of Leamington. Its useable volume is 6,820 m³.

Capital Plan of the UWSS

Energy conservation and management is part of the process when determining the UWSS Capital Planning Budget. Development of the Capital Plan encourages the implementation of energy conservation practices for within infrastructure improvements. UWSS has been very proactive in including a number of energy related projects in its capital plan for 2020-2025.

Some energy conservation objectives that were approved, included in capital plans, and completed from 2019-2023 are listed below:

2019:

- High Lift Energy Monitoring System
- Essex Water Tower Mixer
- High Lift #8 Soft Start
- Wastewater Pump #1 Soft Start
- Low Lift #4 Pump Soft Start
- High Lift #5 Pump Soft Start
- Air wash Blower #1 Soft Start

2020:

- DAF System for Clarifier #2
- Raw Water pH Adjustment System
- High Lift #9 Soft Start
- Clarifier #1 Blow off Valve

2021:

- Dissolved Air Flotation (DAF) Phase I Construction
- Filter #2 and #4 Rehabilitation and Upgrades
- Low Lift Pump #6 Rehabilitation
- High Lift Pump #4 Improvements

2022:

- DAF #1 Construction Phase 2
- Low Lift #7 Rehabilitation
- Treatment Plant Building Improvements - Admin Area
- Highlift Pump #9 Major Maintenance
- 2-4" Air relief valves, HL Pump #8 and #9

2023

- Variable frequency drives for Cottam Booster Pumps
- New Capacitors for RWTP MCCs
- Smart Hydrant Monitoring System Improvements
- Low Lift Pump #2 Upgrades
- Low Lift Roof Replacement

This CDM Plan complements the Capital Planning Budget in defining practical objectives in order to realize the goal to create an energy efficient and comfortable environment in the UWSS.

UWSS Energy Background

Population

UWSS provides drinking water to residential, commercial and industrial customers in the Municipality of Leamington, the Town of Kingsville, the Town of Essex, and the Town of Lakeshore. The area is experiencing population growth due to the relatively low cost of living.

UWSS provides water to all of the population in the Town of Kingsville and Municipality of Leamington, 18% of the population in the Town of Lakeshore and about 50% of the population in the Town of Essex. In total, the UWSS provides water to approximately 65,000 residents along with numerous commercial, industrial. The UWSS also provides treated water to a large greenhouse industry that is concentrated in the Leamington and Kingsville area.

Population in the municipalities that are supplied drinking water by the UWSS is projected to continue rising in the foreseeable future. As population grows, more water shall be consumed. Further, the greenhouse industry is currently in a growth phase that is anticipated to continue for the next few years. Subsequently, the demand for energy usage for UWSS will likely rise.

The water demand for the area varies greatly depending on the industry in the area. There are many greenhouses, food processors, and other industries in the area that greatly influence the water demand. The greenhouses, food processors, and other industries water demand requirement is difficult to determine as their water demand requirements change depending on the crop, time of year and varying meteorological conditions. Additionally, UWSS does not have control over the building of new greenhouses. Municipalities are responsible for planning and growth.

Energy Costs

Energy consumption and costs are relatively high in Ontario. The figure below shows the significant increase in electricity costs over the last decade, taxing municipal reserves.

UWSS obtains electrical energy and natural gas from the Local Authority Services (LAS). LAS has approximately 160 participating organizations in the program. Its rates are lower than Enbridge and Union Gas rates.

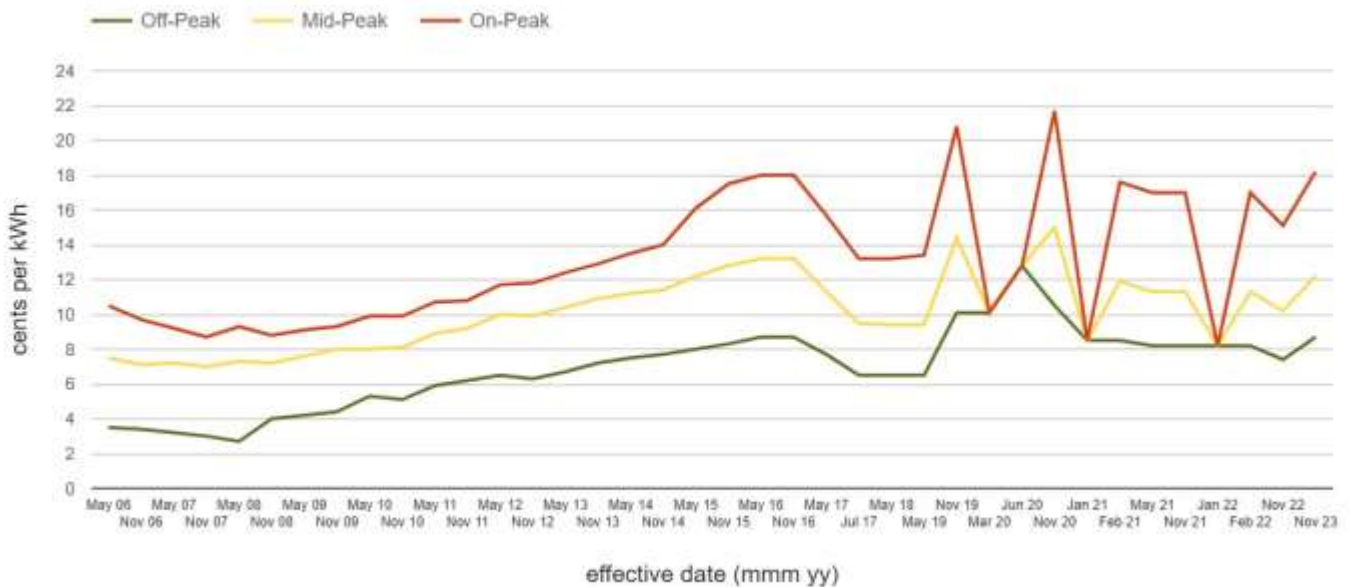


Figure 1 Historical TOU Electricity Rates¹

The ToU prices are primarily for users with utilization rates under 50kW of average demand such as small pumping station, small commercial and residential locations.

¹ Ontario Energy Board, 2024



Figure 2 Historical Tiered Prices²

Tiered is primarily for the medium size facilities, where UWSS facilities fall under this category with exception of the water treatment plant. However, for the purposes of highlighting the rise in the electricity prices over the years both of the above figures display a comparable trend.

Average HOEP plus Average GA

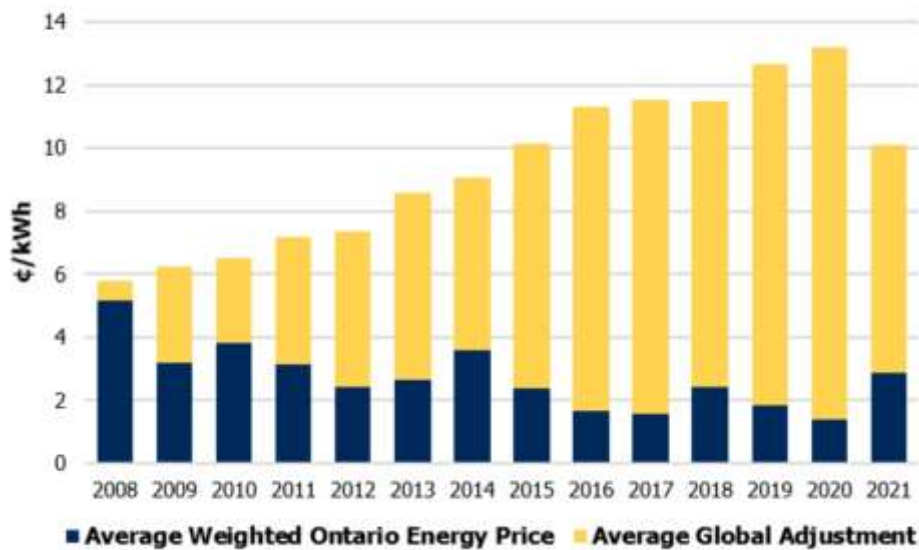


Figure 3 Historic HOEP and GA Blended Cost³

² Ontario Energy Board, 2024

³ IESO, 2024

For the water treatment plant, Hourly Ontario Energy Price (HOEP) in combination with Global Adjustment (GA Class B) is used for determining the bulk of the typical invoice from the Local Distribution company (LDC). Unlike the figures before, total cost is steadily rising, however UWSS has taken significant measures to mitigate the global adjustment portion of the electricity bill through reduction in electrical consumption (for class B customers reducing electrical consumption is the only way to reduce GA costs unlike the Class A – based on electrical demand).

The Ontario water and wastewater treatment sectors are the largest municipal electricity consumers, representing more than a third of annual electricity consumption. In 2011, water and wastewater systems used about 1,815 gigawatt-hours (GWh) of electricity (enough to power about 200,000 homes) and 40 million m³ of natural gas (enough to heat approximately 15,000 homes). This energy use may rise due to ever-more stringent treatment requirements, but these systems also have many opportunities to become more energy efficient, and even to generate renewable energy.⁵

Managing municipal energy consumption efficiently means providing the same services with less energy. Energy conservation measures are often the lowest cost options for providing many other environmental, economic and social benefits. This also results in cost savings, lower environmental load by avoiding GHG and local air, water and land emissions associated with energy production and consumption, local economic development opportunities and associated new jobs, enhanced reliability of energy systems, and reduced price volatility, and improved energy supply security.

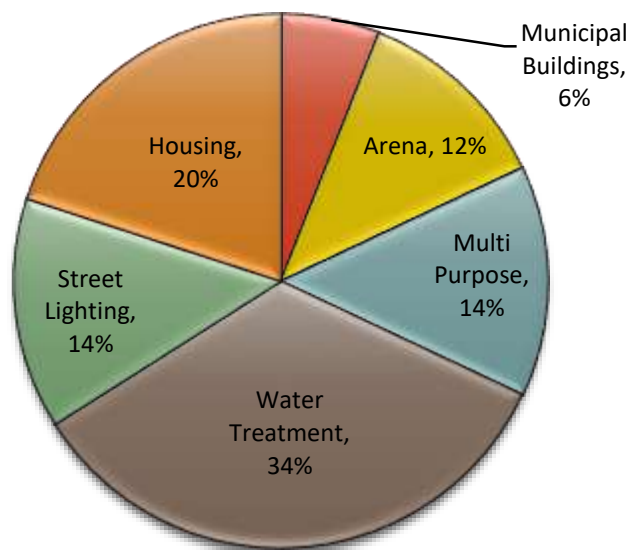


Figure 4: Municipal Energy Use by Sector in Ontario³

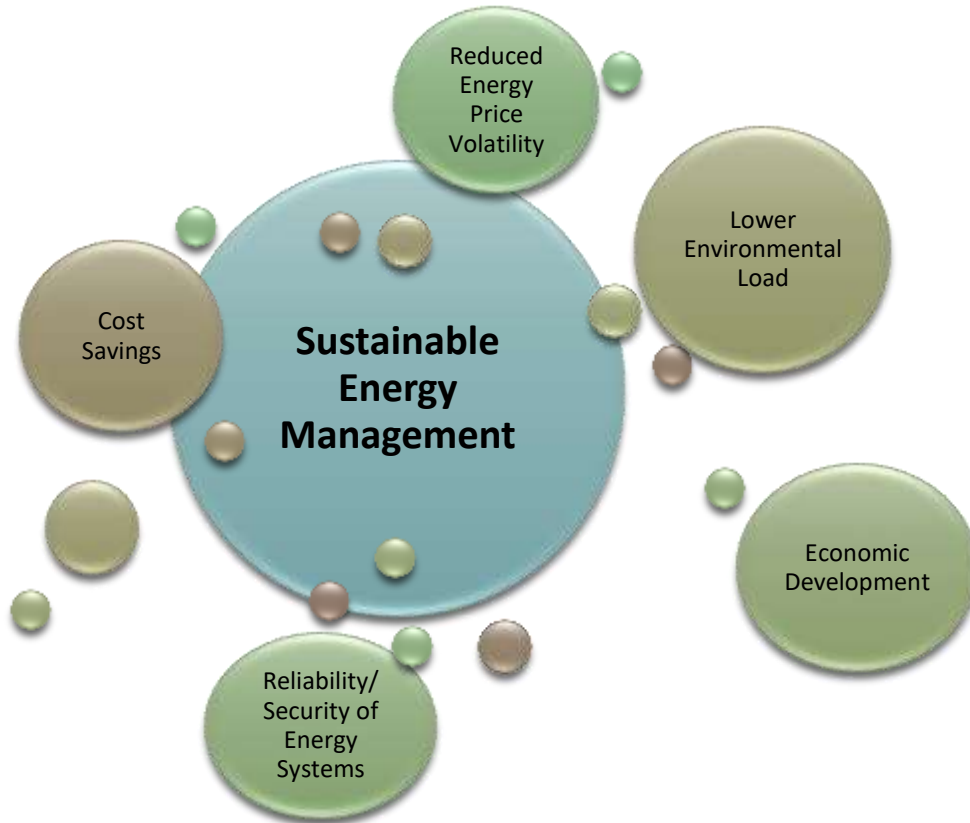
Commitment

UWSS is committed to the promotion of responsible energy management through the implementation of economically viable energy efficiencies and environmental care throughout

⁴ Study Report: Market Characterization & Conservation Potential for Ontario's Drinking Water & Wastewater Treatment Plants (Dec. 2018), IESO, Posterity Group, 113.

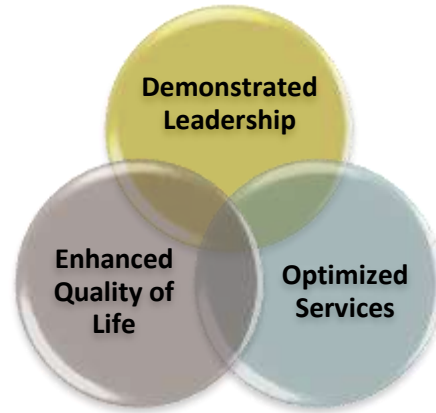
⁵ Every Drop Counts, ECO, 2017

all facilities, plants and equipment. UWSS will take reasonable efforts to minimize impacts to the environment when allocating resources, while recognizing the needs of our residents and visitors.



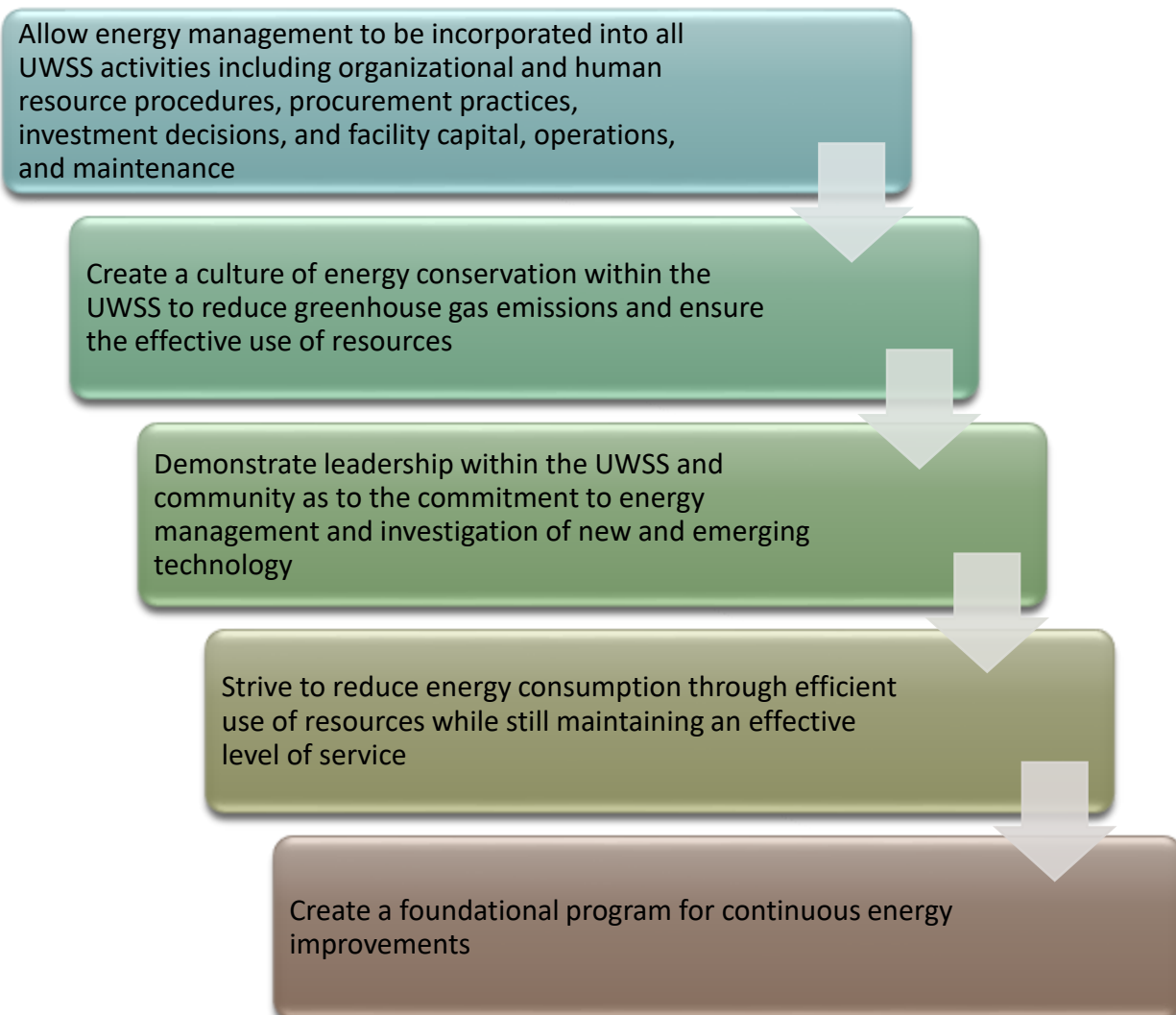
Vision

UWSS will exercise stewardship in the use of finite resources to demonstrate leadership, optimize our delivery of services, and enhance the overall quality of life in the community. We will strive to continually reduce our total energy consumption and associated carbon footprint through wise and efficient use of energy and resources.



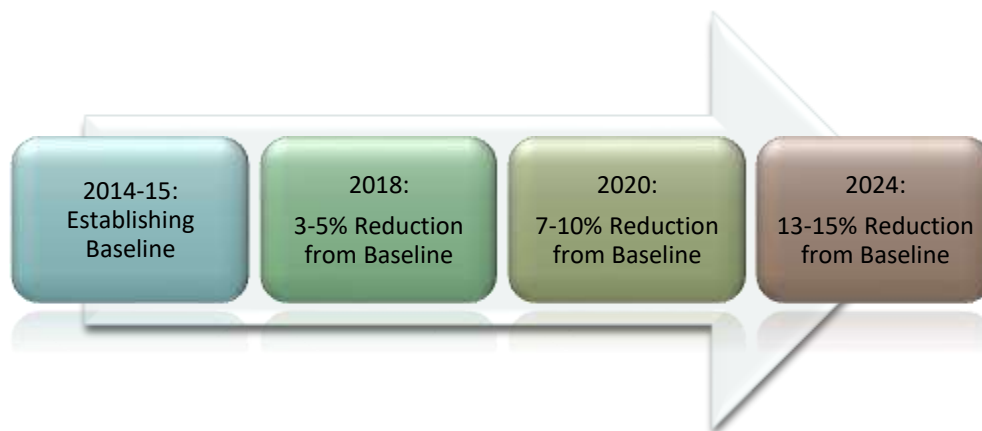
Goals and Objectives

UWSS' Energy Conservation and Demand Management Plan was completed to help achieve the following objectives:



2020-2024 CDM Plan Reduction Targets

Due to the increase in water demand, increase in energy usage was anticipated from the 2014 baseline year's rate of energy consumption. However, based on the index of energy used per unit of treated water, there appeared to be a substantial decrease in energy consumption in that time period. UWSS is committed to identification, assessment and implementation of new ECMs and continuously monitor energy consumption where applicable.



As a target for the last five year CDM Plan, the UWSS vowed to strive to reduce energy (electricity and natural gas) consumption in each building by 13-15% by the end of 2024 from the 2014 baseline.

As a short term target, a 10-13% reduction by the end of 2021 in energy consumption from the 2014-15 baseline was established.

It should be noted that overall energy consumption during the 2014-2022 period increased; this is mainly due to the increased water demand over that period (approximately 44% for the Ruthven Water Treatment Plant). However, the energy used per megalitre of water treated and pumped during that period decreased by approximately 2.6%. This is due to the result of ECMs that were implemented from 2014-2022. The preferred state of energy usage in the UWSS is to continue to comply with the guidelines as set out in its Capital Budget and to always seek improvement to its energy conservation and management practices where applicable.

Energy Conservation Initiatives

The UWSS is aware that energy conservation and management is imperative to creating a sustainable environment and reducing on-going operations/energy costs. UWSS is working towards reducing energy in its facilities, as energy conservation benefits include:

- Energy efficiency save money – Energy savings can be achieved by improving energy efficiency, which means using less energy to provide the same level of service and water quality.
- Energy efficiency extends the life of existing infrastructure – By monitoring equipment for energy efficiency, water systems are more attuned to the overall state of their infrastructure and can proactively take steps to ensure equipment is operating efficiently, thus reducing equipment strain and lowering operation and maintenance requirements.
- Energy efficiency reduces greenhouse gas (GHG) emissions – Reducing energy consumption has a direct impact on reducing GHG emissions.
- Energy efficiency enhances customer relations – Customer expectations and concern for water are increasing, thus energy providers are encouraging energy conservation and energy efficiency in consumer purchases. Effectively communicating energy management efforts as successes to customers and other stakeholders is an opportunity for a water system to establish itself as an environmental steward in the community.

Water Conservation

Energy conservation and management does not only include electricity usage reduction in buildings. Water conservation also play a direct role in the overall target for efficient energy management. The lower the amount of water and waste produced the less energy required for treatment and disposal.

Water efficiency efforts will result in energy savings, as the less water required the less energy consumed to treat, pump and distribute the water through the water system. Savings can be realized through supply side water efficiency efforts and through demand side water conservation efforts. Some supply side water efficiency efforts would be water accounting, water loss control, or leak detection and repair. Some demand side water conservation efforts would include public outreach and education program to reduce water consumption, free water audits for large volume customers, retrofit programs for residential customer, water price, and water use regulations.

One way to encourage water conservation is to *ensure all users are metered*. UWSS is responsible for treating and transmitting water to end-users. The municipalities are responsible for the actual local distribution system and for customer metering. The majority of the municipal water users are metered. Additionally, UWSS maintains multiple water meters at the boundaries between the four municipalities to determine and make improvements for water loss.

UWSS endeavors to support its municipal partners to install water meters for all customers, as the installation of water meters have **multiple benefits**:

Immediate water usage reduction

Historical statistics have shown that buildings reduce water consumption immediately following the installation of water meters.

Ability to detect water loss/leaks

The summation of all water meter readings over a period of time can be compared to the amount of water output at the WTP over the same period of time to see how much of the treated water actually gets consumed. This verification check could provide an indication of water loss or watermain leaks should the consumption be much lower than the water output.

These two parameters should be compared on an annual basis for a meaningful analysis. Should the gap between them increases, it is likely that watermain leaks are worsening and an investigation may be warranted.

Increase capacity of Water Systems

All water systems have a rated capacity or maximum output that they can produce. Should output be near the rated capacity (~80% of rated capacity) as demand increases, studies should be initiated to increase the capacity which would typically involve major upgrades to the systems.

Reducing water consumption has a direct effect on reducing output of the water systems and could avoid costly capital upgrades.

This is in turn beneficial from the municipal planning perspective as there would be capacity to accommodate new housing or commercial/industrial developments.

Decrease energy consumption of Water Systems

Water systems are costly to operate. The treatment and pumping of water are very energy and chemically intensive. Reducing output from these systems directly decreases energy and chemical costs.

Projects Implemented: 2012-2023

UWSS has always been proactive towards energy conservation and has initiative various activities that would assist towards efficient use of energy. Some of the projects that UWSS has implemented in the last seven years are shown in the following table:



UWSS M&T Project

In 2018, OCWA undertook the installation of energy power meters with eight metering points at the Union Low Lift Station. This project combines process flow data and energy consumption data to populate energy and GHG intensity (KPIs: kWh per m³,) for analysis and trending. A dashboard was developed with current and historical flows for LLPs and is displayed in real time in the control room. The system has reporting features

As an update since the last CDM, the system was expanded to the Water Treatment Plant in 2020. The addition included installation of a wall mounted TV to display the current plant performance, as well as an HMI where operations can review the energy trends and benchmarks for the facility. Furthermore, the system incorporated GHG emissions calculator based on the amount of energy consumed.

Innovation and Pilot Initiatives

The UWSS has been participating in some innovative projects to enhance the efficiency of the water system. A few of these projects will be described below, which include Growing Smart Water Communities), Climate Risk Assessment (completed 2013), and Application of the Optimal Industrial Load Management Model to the Ontario Clean Water Agency Water Pumping Station (completed 2013). Likewise, UWSS has participated in an Energy Auction Pilot (administered by IESO) as part of the demand reduction initiative for the Ontario Electric Grid through a capital project at Cottam Booster (Completed 2023). In addition, UWSS has implemented new instrumentation systems that have reduced potable water consumption at the Ruthven WTP by 15 Mega liters (Completed 2022).

Climate Risk Assessment

Genivar completed a Climate Risk Assessment for the UWSS in May of 2013. UWSS, Engineers Canada and the Ministry of the Environment, Conservation and Parks worked together to assess the engineering vulnerability of the UWSS infrastructure to the potential impacts of the current and future climate. The project assesses the national engineering vulnerability of public infrastructure to climate change based on the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol Version 10 BETA (October 2011). The PIEVC Protocol was started in 2007 and has been refined and improved over the years in adoption of best practices at the national level. The two (2) main aspects of the climate analysis and projections were:

- Establish a set of climate parameters describing climatic and meteorological phenomena relevant to the geographic areas of the UWSS
- Establish a general probability for the occurrence of each phenomenon, both historically and in the future

The conclusion from the project resulted in the UWSS being noted as resilient to potential climate change, specifically when comparing existing conditions to those anticipated in the 2050s. The results of this assessment have been used to include climate resilience within UWSS infrastructure projects such as the DAF #1 unit, and new improvements that are currently underway such as the DAF #2 unit, High Lift pump station upgrades, reservoir #3 expansion.

Application of the **Optimal Industrial Load Management Model** to the Ontario Clean Water Agency Water Pumping Station.

UWSS worked with the University of Waterloo to complete a water model on the pumping capabilities in the water system. The water model used was the Optimal Industrial Load Management (OILM) model. The objective of the project was minimizing energy consumption and/or the peak power load for the RWTP, which is based on the set of water pumps that have the most important loads in the facility (high lift pumps). Individual water discharge and power consumption were estimated based on measurement of active power, water discharge, and operation pump times. The estimations were used to develop polynomial function models for the pumps to include in the OILM model that optimally dispatches the pumps considering 15-minute time intervals. The resulting simulations showed that considerable savings may be obtained as a result of the optimal dispatch of the pumps.

2014-2022 Energy Consumption Summary

Tracking Energy Consumption and Savings

In addition to including the UWSS' 2021 annual energy report as required under the regulation, we have also included and considered our 2022 annual energy consumption information, which helped us to report on our achievements and inform the development of new measures (see Schedule 1). Our previous years' annual energy reports, along with the 2014 and 2019 energy conservation and demand management plans can be found on our website at www.unionwater.ca

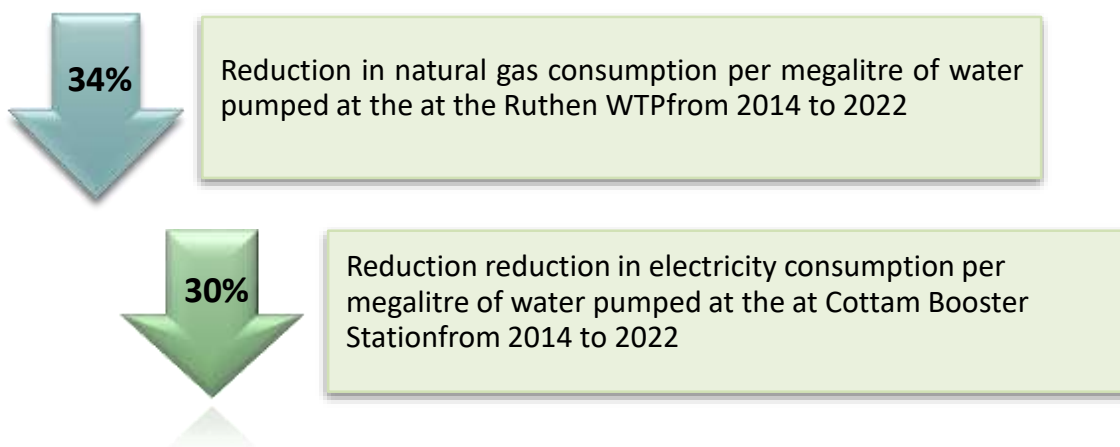
Overall, electricity consumption across all UWSS facilities increased by 41.4% between 2014-2022. Natural gas consumption decreased by 5.9% during this period this is mainly due to the increased water demand over that period (approximately 44% for the RWTP). However, the energy used per megalitre of water treated and pumped during that period decreased by approximately 2.6%. This indicates that the energy conservation measures that were implemented from 2014-2022 were successful.

Though total annual electricity and natural gas consumption have increased at some of the facilities over the years, *the quantity of electricity and natural gas consumed per unit of flow (energy intensity) prove that the facilities' energy intensities have in fact been reduced by over 2.6% for Electricity and 35.2% for Natural Gas since 2014. That said, the 2024 Energy Reduction Target has been surpassed for natural gas, but historically high water demand has caused the water plant to lose electrical efficiency.*

Increased efficiency in energy usage is beneficial to water customers as it helps maintain lower water rates.

Please see Schedule 1 for a detailed analysis of the UWSS' energy consumption

From 2014 to 2022, the greatest reductions achieved at the UWSS were:



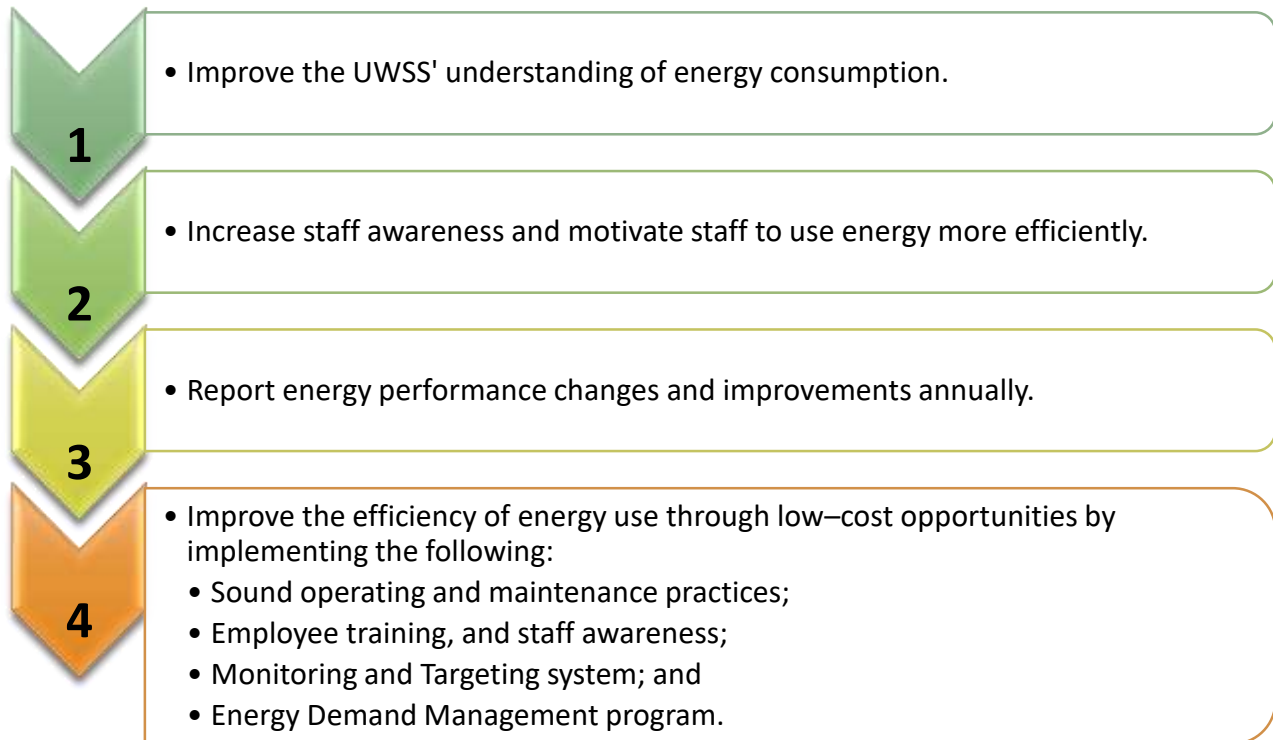
Looking forward: 2025-2029

UWSS recognizes that measures can take place to ensure energy savings continue to grow and that new conservation measures are identified and acted upon. Concerns over ever-increasing energy prices and the negative impact of fossil fuels on the environment have raised interest in sustainability and predictable energy rates.

Energy conservation has been an on-going process in all buildings. As per the Capital Budgeting Plans of the UWSS, new capital infrastructure projects including replacement/retrofit works are encouraged to be built and sustained in a manner that minimizes energy consumption. Electrical equipment replacement works over the years have been evaluated against energy efficiencies criteria, and the most cost-effective option at that time was chosen.

UWSS will strive to **reduce its energy consumption (electricity and natural gas) by 3-5% by the end of 2029 from the 2014 baseline**. This Energy Reduction Target will apply to all facilities owned by the UWSS.

The UWSS commits to the following objectives for the 2025-2029 period:



Proposed Energy Conservation Measures

Energy conservation projects can be categorized as technical (switching lighting from fluorescent or high pressure sodium to LED), organizational (establishing a green team), or behavioral (turning lights off when not needed).

Potential energy conservation projects were identified by comparing building-level energy benchmarks to the median energy benchmark for that building type.

Building equipment tend to lose their efficiency as they approach the end of their useful life. A plan should be developed to replace the equipment by evaluating the life cycle cost of the replacement options.

As discussed previously, UWSS has been continuously improving equipment and their energy efficiency. The creation of this Plan confirms that UWSS already conforms with the steps for an energy improvement program. UWSS has already implemented many ECMs.

Based on the steps for the energy improvement plan described in the Implementation section below, UWSS has proposed the following conservation measures for implementation in the next 5 years:

Technical Measures

Efficiency Measure	Status
<u>New WTP Reservoir #3 Engineering – higher storage potential, energy conservation from the low lift process, as pumps will operate for longer periods of time at lower TDH when optimized.</u>	To be completed 2024
<u>Leak Detection Study – identify water losses that directly impacts the amount of water required to be pumped</u>	To be completed 2024
<u>DAF #1 Optimization and WTP Capacity Testing at WTP – reduction in the energy consumption for the compressed air lift</u>	To be completed 2024
<u>DAF #2 construction at WTP - new equipment will have higher efficiency rates than DAF #1, allowing to process more water per unit of energy)</u>	To be completed 2025
<u>Rehabilitation of Low lift pumps #2 and #4 at Low Lift – improvement in the pumping potential per unit of energy consumed</u>	To be completed 2024

<u>Installation of the new High Lift Pump #7 & 8 at WTP – new pumps and high efficiency motor and VFDs will provide reduced energy consumption rates per unit of water pumped</u>	To be completed 2025
<u>Cottam Booster valve upgrades for pumps – reduction in dynamic headloss (pressure) when pumps are in operation, as well as backflow leaks causing the station to improve its efficiency for energy consumption per unit of water pumped</u>	To be completed 2024
<u>Backwash pump refurbishment – reduced energy consumption for backwashing process</u>	To be completed 2027-2028
<u>High lift pump #9 refurbishment – energy efficiency gains in water pumping</u>	To be completed 2026
<u>HL Compressor replacement – reduced costs associated with compressed air application at the WTP</u>	To be completed 2027-2028
<u>Cottam Water main Upgrades - reduction of the friction losses through increase in diameter, higher efficiency for the Cottam Booster pumps in terms of energy consumed per unit of water pumped</u>	To be completed 2026-2027

Organizational Measures

Efficiency Measure	Status
Maintain an energy management team and update in 2025	Ongoing
<u>Implement Working Energy Groups (bi-annual meetings to keep staff informed of the changes in the energy market, and refresher on identifying energy efficiency measures)</u>	To be completed 2024

Behavioural Measures

Efficiency Measure	Status
Place poster near kitchen/bathroom sinks reminding users to limit water usage where appropriate	2024
Place poster/sticker near light switch in rooms reminding users to turn off lights when no one is in the room	2024
Continue to ensure the temperature of facilities meets the needs of the users	On-going review once a year
Harvest day light where possible by opening blinds instead of using electric lighting	Ongoing

Close windows when air conditioning is in operation	Ongoing
Energy Efficiency Awareness Training for Operators (completed as part of the Energy Working Groups)	2024

Renewable Energy Projects

Efficiency Measure	Status
Conduct assessment for renewable sources of energy (solar and energy storage)	To be investigated 2025-2026

Best Practices

Best practices for implementing energy savings by reducing energy consumption or implementing other measures are described below for different methods for water systems and buildings.

Water Systems

Water systems consume a lot of energy in the production and distribution of drinking water. There are substantial opportunities to reduce energy costs by implementing operational changes, adding VFDs, using properly sized equipment, etc. Installing renewable energy will also assist in reducing energy costs. Best practices for these items are discussed in more details below.

Variable Frequency Drives

Normally, pumping represent the largest port of energy consumption at a drinking water system. Improving pump and motor efficiency should be the focus of a system’s energy management program, thus correcting for inappropriate pump sizing, upgrading standard efficiency motors with premium efficiency motors to installing variable frequency drives (VFDs). VFDs are electronic control devices that modulates the amount of power being delivered to a motor to allow for continuous matching of motor speed to load requirement for the pump. VFDs accommodate fluctuating flow demands, avoiding losses from throttled valves and bypass lines (unless it is a static head system), allow “soft starts” (reduces wear and tear on the motor) and provide more precise control of the process. Normally, savings of 10 – 50 % can result when VFDs are installed to increase motor and pump efficiency in drinking water systems. Although, VFDs will not save energy for systems without variability and will only yield benefits when properly operated.

Motor Efficiency

An effective way for drinking water systems to improve their energy performance is to replace the inefficient motors with higher efficiency models. By maintaining ventilation and temperature control to the optimal operating conditions provided by the motor manufacture will can result in motor efficiency at the operations level with very little capital expenditure.

Operational Changes

Changing normal operational settings can result in energy cost savings. Energy savings can be realized by increasing the difference between the high and low set points for water towers and reservoirs. Energy savings are achieved as the pumps will not turn on as frequent and should also decrease pump run times (increase in useful life for equipment). Some operational settings could be changed to allow energy usage during the off peak energy times to decrease the electricity costs for the system. Some energy providers offer incentives and rebates for consultations with them, as agreements may be negotiated about load shifting opportunities.

Proper Equipment Sizing

Water systems are often designed for future demand purposes, and are therefore oversized for the current usage. Proper equipment sizing involves matching pumps to their intended duty and flow rate, as oversized pumps add to system operating cost in terms of energy and maintenance requirements. Some corrective actions to address oversized pumps are to replace the pump/motor with a downsized version; replace the impeller with a smaller one; install VFDs to match variable speed to load requirements for the pumps, and add a small pump to reduce the intermittent operation of the existing pump.

Renewable Energy

Renewable energy projects can be built to reduce the dependence on the energy grid. Renewable energy projects could include solar, wind, or geothermal system to generate power. Renewable energy projects combined with energy storage projects can be leveraged to reduce the peak demand for the facilities and will reduce significant energy cost to UWSS.

Buildings

Nearly all buildings have lighting and heating, ventilation and air conditioning (HVAC) components, and they typically account for nearly all of the energy consumption in non-industrial buildings. Lighting and HVAC along with the building envelope upgrades are the major works that could lead to energy savings. Best practice measures of the three components are provided below; however, this does not mean all buildings should implement the measures below as each project is different and various factors (i.e. life cycle cost, long term use of the equipment/building, etc.) need to be considered.

Lighting Retrofits

There have been significant improvements in the area of lighting technology in recent years. Energy savings can be achieved by replacing older incandescent, T12 fluorescent, and metal halide lamps with T8 fluorescent, T5 fluorescent, compact fluorescent (CFL), and LED (light-emitting diode) lamps. Newer technology can produce the same amount of light for half or less of the input power, thereby reducing half or more energy consumption. At the same time, lighting levels should be optimized to meet needs - if a 100W and 80W light bulb both can produce sufficient lighting level for the location, consider installing the 80W light bulb.

Lighting motion sensors could be a beneficial add-on for areas of infrequent occupancy, as most people do not turn off lights when they leave the area. This would ensure the light is automatically turned off when the area is not occupied.

Heating, Ventilation and Air Conditioning (HVAC) System Upgrades

HVAC system improvements offer the greatest potential for energy savings in most buildings. The first step for reducing HVAC operating costs in large buildings is to reduce HVAC loads. "Greening" an existing building may also include replacing equipment with more efficient models, improving controls and operating procedures, and retrofitting existing equipment to operate more efficiently. It must be realized, however, that HVAC systems contain many interrelated components, and upgrading them takes careful planning, professional engineering design, and careful implementation. Properly designed, installed and maintained HVAC systems are efficient, provide comfort to the occupants, and inhibit the growth of moulds and fungi.

Buildings usually operate under less than full-load heating and cooling conditions. Therefore, the greatest overall efficiency improvements will result from giving special consideration to part-load conditions and selecting equipment accordingly. Chiller manufacturers now provide a standard rating for part-load efficiency, reflecting the fact that chillers operate at less than full load 99% of the time. Staging multiple chillers or boilers to meet varying demand also greatly improves efficiencies at low and moderate building loads. Pairing different-sized chillers or boilers in parallel offers greater flexibility. Units should be staged with microprocessor controls to optimize system performance.

The fan motors in packaged units typically run at constant speeds. Variable frequency drives (VFDs) can be installed on the motors to match the fan output to the required airflow. Energy savings vary depending on the specific system characteristics, but in certain cases can be 50% or higher.

Programmable thermostats should be utilized where possible. It can be used to specify an automatic reduction in temperature overnight. Typical savings are 2% of the heating bill for every 1°C that the temperature is reduced overnight.

Natural gas heating should be utilized instead of electric heaters where feasible as the cost of electricity heating is two to three times the cost of natural gas heating.

Building Envelope Upgrades

Reducing a building's energy consumption often revolves around changes to its mechanical and electrical operations or system. However, a building's roof and walls may also provide significant energy savings.

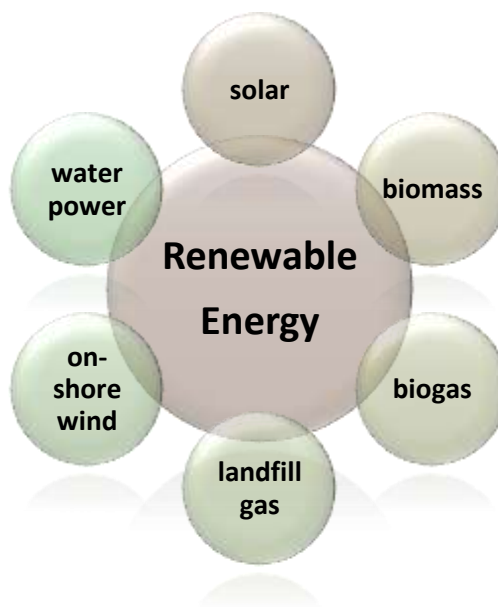
Adding/improving insulation to the roof and walls reduces the amount of heat lost to the environment in the winter and also reduces the heat coming into the building in the summer. By implementing this measure, studies have shown a building could reduce the heating and cooling load substantially. This is generally a high cost measure for existing buildings since the roof and walls essentially need to be rebuilt. The most effective strategy is to coordinate the work with a roof or wall replacement.

Renewable Energy

The UWSS has not currently applied for any renewable energy projects. They are looking into the options for a few different projects. UWSS may apply for funding program to explore adoption of energy efficient technologies for any new building.

UWSS is exploring solar PV project, as there are about three acres available on the RWTP grounds to install solar panels.

UWSS may also install solar panels for some of their larger district water meters. The Meter #27 site will be reviewed for a solar panel installation. If it is successfully installed, UWSS may install solar panels for other water meter sites.



Operational and Behavioural Changes

To help meet the increasing demand for energy, as outlined with Ontario's Long Term Energy Plan, conservation has become an integral part of the future to help meet the ever increasing demand for energy.

Studies have stressed the importance of engaging the people working within the facility along with technological changes to achieve meaningful and lasting energy consumption savings. This has been shown to result in much higher energy savings than just implementing energy technology or engaging people alone.

Plan Implementation

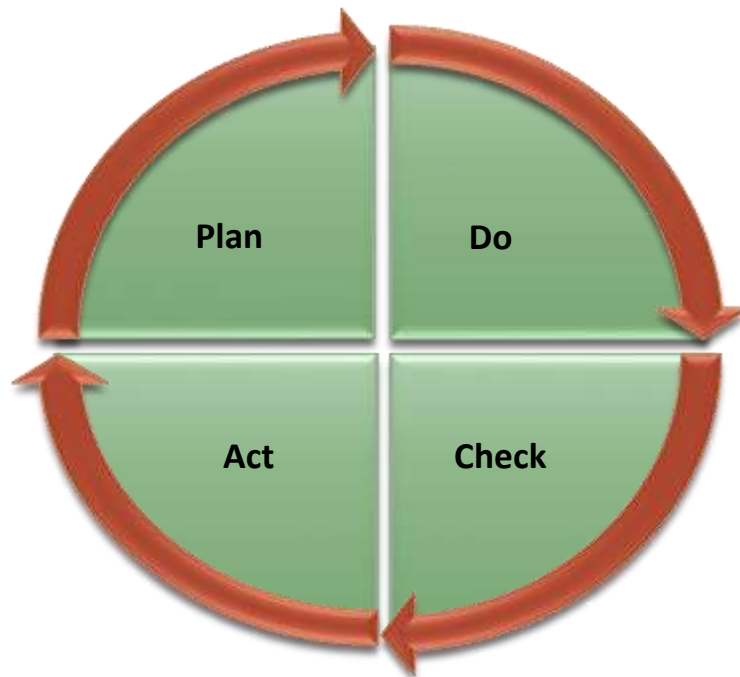
Ontario Regulation 507/18 requires increased municipal energy management and engagement. Development of an energy conservation strategy as part of an overall sustainability plan is a complex process. The main driver for a local municipality service board or utility to change the way energy is used relates to fiscal benefits and financial incentives. Energy is a manageable input to the business process, much like any other resource cost.

This CDM Plan provides the "big picture" view as an ongoing framework for optimizing overall energy use and achieving success.

Current practices must be enhanced and new approaches must be developed. To meet these needs, UWSS will consider designing a comprehensive program for collecting and analyzing monthly energy billing information, and ensuring that staff is informed about energy consumption. The resulting energy costs and consumption database will be used to monitor excessive variations, target facility follow-up assessments, and determine areas that could be candidates for improved conservation. These monitoring enhancements will improve the UWSS' understanding of the bottom line impact of energy management.

In order to establish a baseline for managing energy costs, the UWSS has captured information critical to energy management planning. This formalizes the process involved in understanding the relative magnitude of energy costs, the possible ways to reduce energy use, energy targets that are likely to be achievable, and other associated activities that need to occur.

The CDM Planning is intended to be a process of “continuous improvement.” The UWSS follows *NRCAN, ISO 50001*’s four step plan–do–check–act management methodology, used in business for the control and continuous improvement of processes.



PLAN

Establish the energy conservation objectives and processes necessary to deliver results in accordance with the expected outputs: the energy conservation targets or goals. Start on a small scale to test possible effects and financial feasibility. Develop an Energy Conservation Demand Management Plan prioritizing budgets, resources, and timelines.

DO

Implement the plan and collect data for analysis in the following "CHECK" and "ACT" steps. Develop projects' design and execution, preparing status reports, and implementing the communication strategy.

CHECK

Study the actual results (measured and collected in "DO" above) and compare against the expected results (targets or goals from the "PLAN") to ascertain any differences. Evaluate any deviations in implementation from the plan and also evaluate the appropriateness and completeness of the plan to enable the execution, i.e., "Do".

ACT

Recommend improvements and adjustments to the initial plan; determine the course of corrections and modifications to the plan.

The UWSS implements tools to maintain and continually improve energy conservation and demand management. Benchmarking is the process that the UWSS has implemented for collecting, analyzing and relating energy performance data of comparable activities to evaluate and comparing performance between or within entities.

Four Pillars for a Successful Energy Management Program



Top Management Support

Top Management shall make a commitment to allocate manpower and funds to achieve continuous improvement. To establish the energy management program, UWSS should:

- ✓ Obtain Board of Directors endorsement
- ✓ Assign energy management responsibility
- ✓ Institute an energy policy

Strategy Plan

Assess Energy Performance

Understanding current and past energy use helps UWSS identify opportunities to improve energy performance and gain financial benefit.

- ✓ Data Collection, Management, Analysis and Evaluation
- ✓ Establish Baselines and Benchmarks
- ✓ Conduct Technical Assessments & Audits

Set Goals

Performance goals drive energy management activities and promote continuous improvement. Setting clear and measurable goals is critical for understanding intended results, developing effective strategies, and reaping financial gains.

- ✓ Determine Scope and Goals
- ✓ Estimate Potential Improvement

Create and Implement Action Plan

Once past performance has been assessed and the goals set, an Action Plan can be created. A detailed action plan is used to ensure a systematic process to implement energy performance measures. Unlike the policy, the action plan is regularly updated, most often on an annual basis, to reflect achievements, changes in performance, and shifting priorities.

- ✓ Define Technical Steps and Targets
- ✓ Determine Roles and Resources

Technical Ability

Investments must be made in training and systems. Staff must have adequate technical ability for analyzing and implementing energy saving options.

- ✓ Industry Seminars & Conferences
- ✓ Certified Director of Public Works
- ✓ Other Energy related training

Monitoring Systems

Evaluate Progress

Evaluating progress includes formal review of both energy use data and the activities carried out as part of the action plan as compared to your performance.

- ✓ Measure results and Benchmark
- ✓ Review action plan

Recognize Achievements

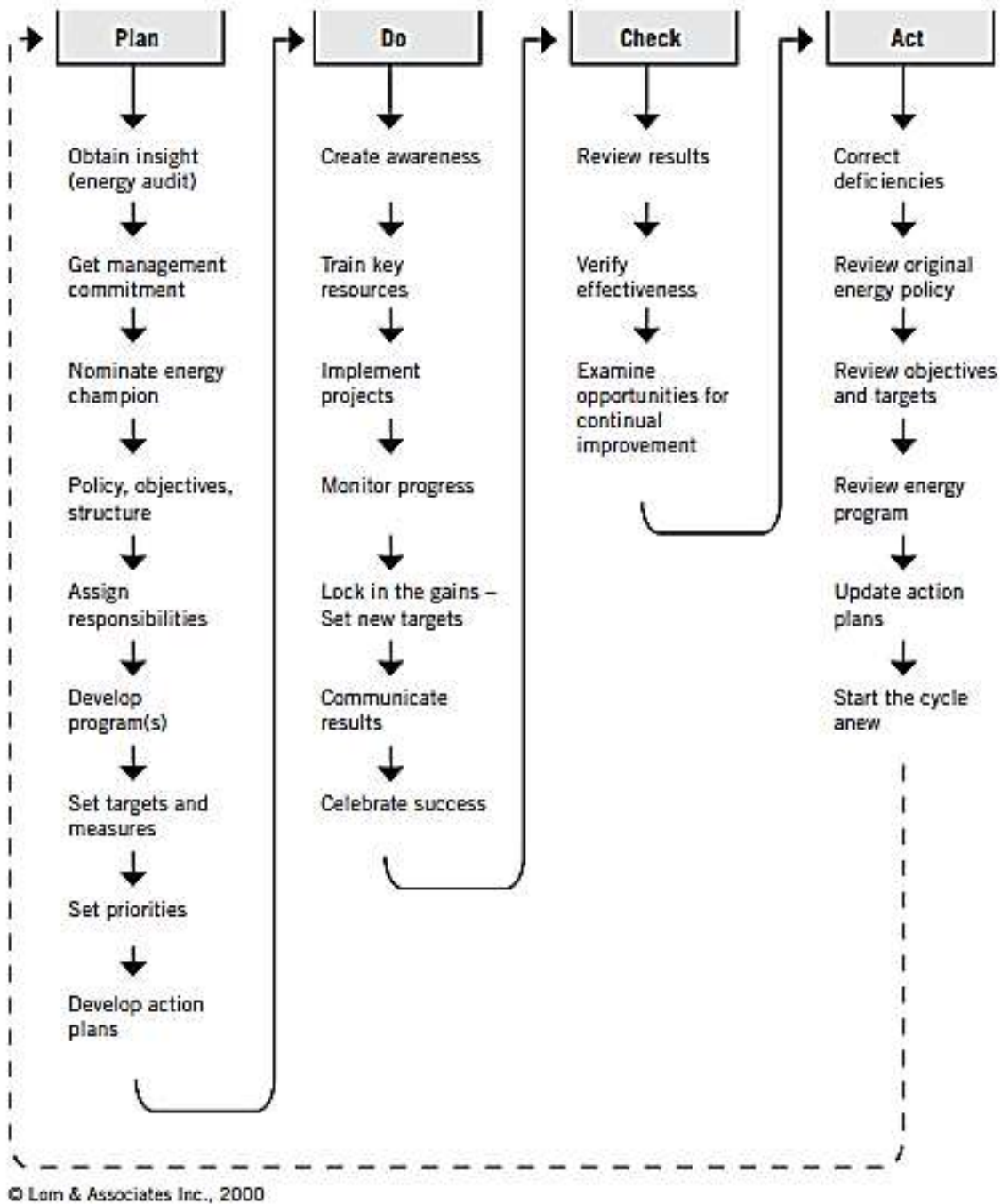
Providing and seeking recognition for energy management achievements is a proven step for sustaining momentum and support for your program.

- ✓ Internal Recognition
- ✓ Determine recognition type and action

✓ External Recognition

The detailed energy conservation project planning process is visually illustrated on the following page.

Energy Conservation Project Planning Process⁶



⁶ Energy Efficiency Planning and Management Guide, CIPEC, 2002

A planning framework acts as an overall guideline to ensuring energy conservation will be realized. Three planning measures are identified: *structure planning, resource planning, and procurement planning*.

Structure Planning

Consideration of Energy Efficiency for All Projects: incorporate life cycle cost analysis into the design procedures for all capital projects as well as procurement decisions for equipment and other UWSS assets. Life cycle cost analysis is a technique to assess environmental impacts associated with all the stages of a product's life from-cradle-to-grave. It can avoid a narrow outlook on environmental concerns by: 1) compiling an inventory of relevant energy and material inputs and environmental releases; 2) evaluating the potential impacts associated with identified inputs and releases; 3) interpreting the results to help make a more informed decision.

Energy Skills Training: provide skills training for operators and employees that have hands-on involvement with energy consuming systems to enhance their capacity to achieve energy efficiency improvements. Training will help lower operating costs, reduce greenhouse gas emissions, increase operational efficiency, and create a better work environment.

Procurement Planning

Energy Purchasing: investigate utilizing purchasing groups and/or cooperatives to procure diesel, gas, natural gas, and electricity. The investigation will include the analysis of cost considerations, available energy services, energy quality, and other performance factors. The goal is to obtain the optimal rates while achieving an appropriate level of cost certainty.

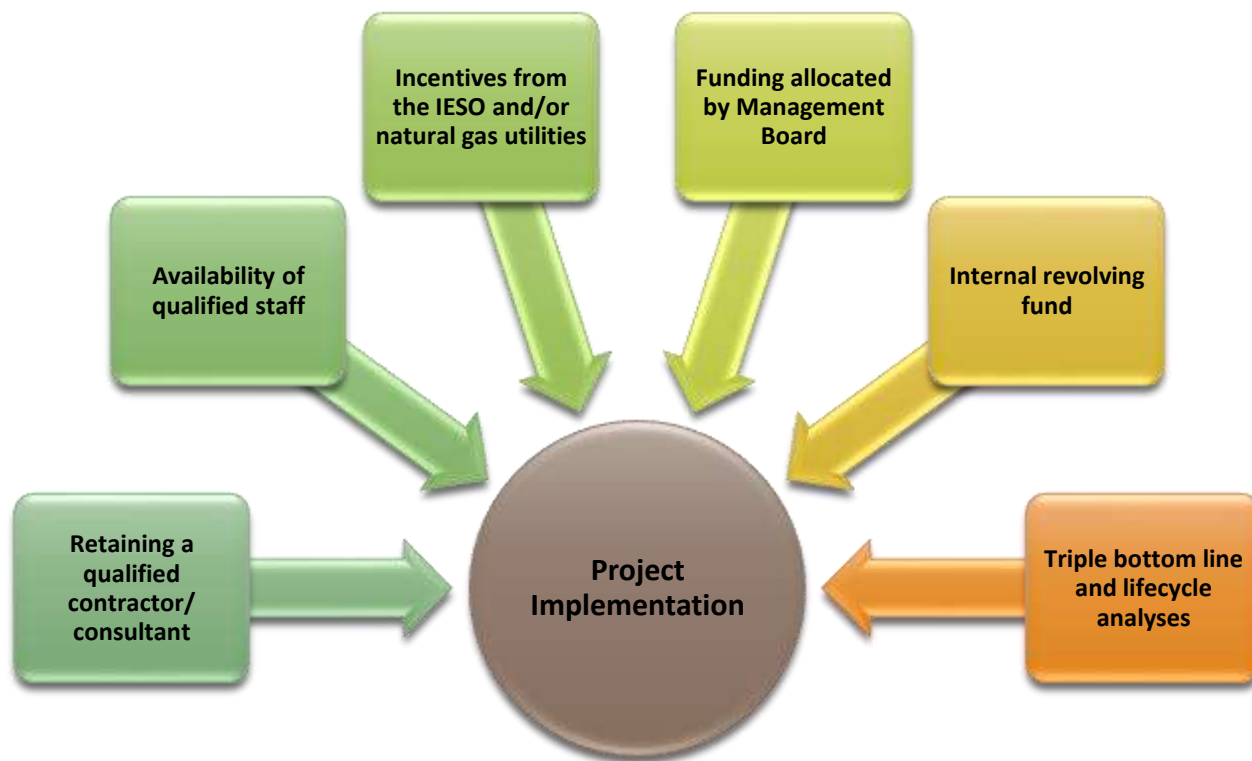
Consideration of Energy Efficiency of Acquired Equipment: incorporate energy efficiency and life cycle costing into the criteria for selection and evaluation of materials and equipment.

Evaluation Metric Development

Energy conservation projects will be evaluated using an internal rate of return (the rate of interest the project could generate), along with simple payback (the number of years it would take to pay off the project from the savings). Hydro cost savings and life cycle analysis will be used to derive these parameters. In addition, more costly conservation projects will be bundled with more cost-effective ones to ensure their successful implementation.

Robust Measurement and Verification (M&V) procedure will be adopted with the help of UWSS operating authority to quantify the energy savings as a result of EE projects and will be added to the project completion report.

Implementation of the proposed projects depends on:



Timelines

Timelines are assigned based on measures/facility prioritization. These timelines allow for flexibility during implementation, and will be dependent upon the costs/incentives and business decisions driven by the UWSS. We will carry out the required development of business procedures and communication programs and implement them methodically according to the planned timelines within the resources constraints that apply.

2025 & Beyond

The Energy Conservation and Demand Management Plan is intended to be a living document and flexible roadmap that will provide guidance and encourage the UWSS to incorporate energy management into their daily and future decisions. As capacity building and development of the foundation for successful energy management practices will be the primary focus for the initial implementation of the CDM Plan, future years will allow staff to apply their knowledge to investigate energy efficiency initiatives that will emerge as the energy management field continues to thrive and evolve.

Responsibilities

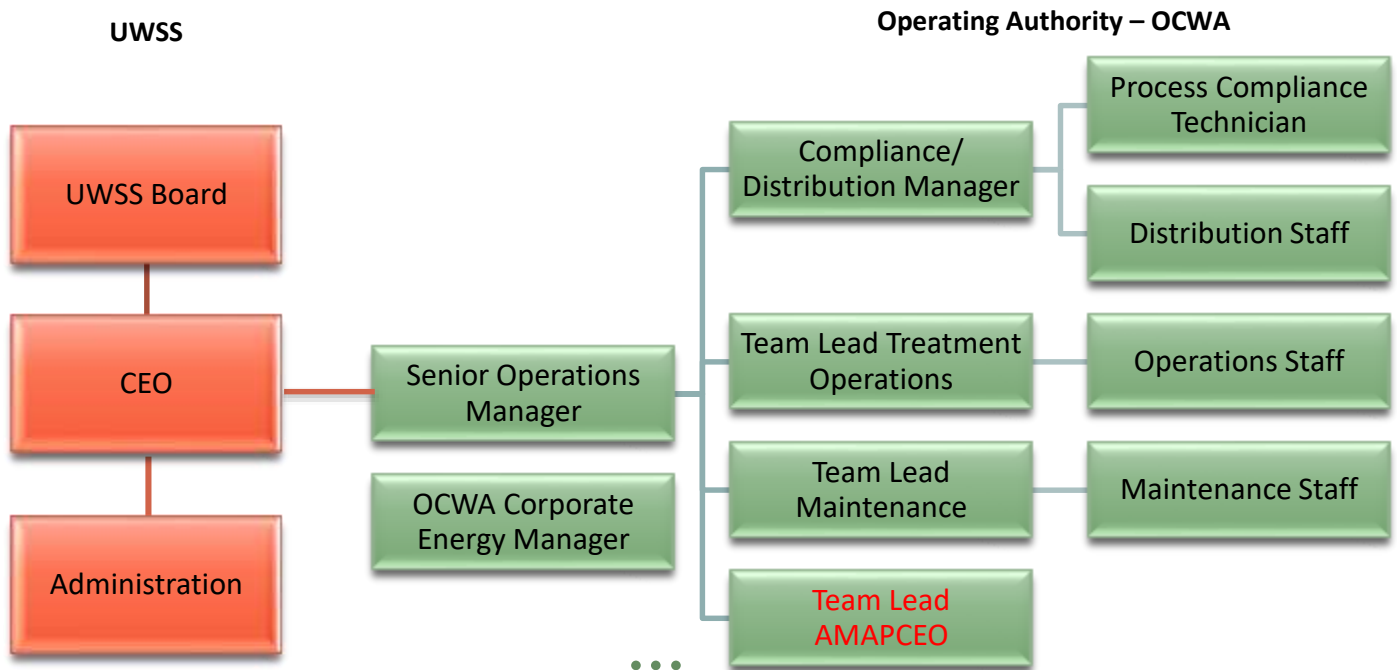
Energy Management Team

UWSS Inc. administration, its Board and the contracted facilities operator, Ontario Clean Water Agency (OCWA) have a responsibility to contribute to overall energy management objectives. Technology alone will not achieve energy conservation and demand management objectives. UWSS will benefit when facility staff realizes how everyday actions can reduce energy waste and decrease operating costs. Simple actions such as turning off lights, computers and printers, ensuring that filters on heating and cooling coils are clean and dust-free, etc., all contribute to reduced energy use and energy costs in UWSS buildings.

The UWSS will implement an Energy Management Team to create and maintain a methodical focus on energy costs. This Team will provide a vehicle for key staff from critical departments to track energy budgets, update energy related projects and develop accountability for achieving energy reduction targets. The Team will have the lead responsibility and accountability for monitoring and achieving energy reduction targets.

Participation and education will be solicited from utility partners, both electrical and gas supplier (if applicable), to ensure up to date information on incentive programs, energy rates and other available assistance. Active participation from these partners will make the Energy Management Team that much more effective.

Structure of the Energy Management Team



Monitoring and Evaluation

We will review and evaluate our energy plan, revising and updating it as necessary, on an annual basis within our corporate planning process.

To ensure the UWSS meets its goals in energy consumption reduction, it is critical that there is regular monitoring and evaluation of its progress. Progress on projects will be monitored using the annual energy reports prepared under the regulation. A separate summary for each project will be prepared and archived.

Short Term Goal

As a minimum, there will be an evaluation at the end of 2025. As stated, a short term target of 2-3% energy reduction by the end of 2025 from the 2014 baseline is established. Energy usage of each facility for the year 2024 will be compiled and compared to the baseline energy usage in 2014. The comparison would provide the UWSS an idea where it stands in meeting the short term goal and the long term goals.

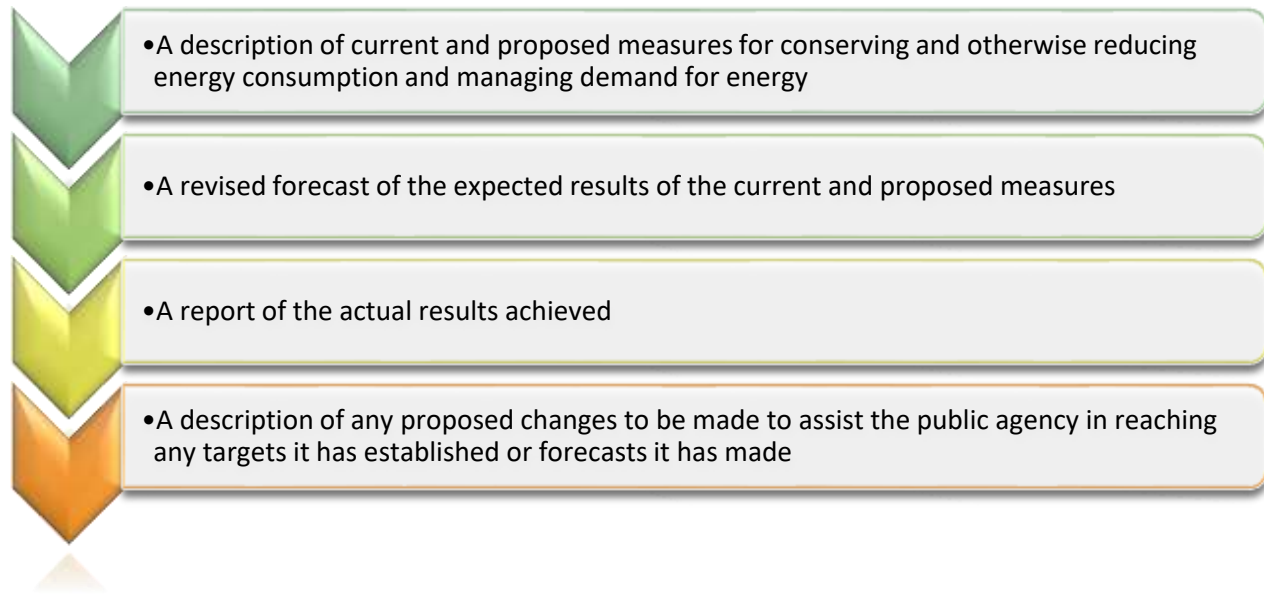
This also provides an opportunity to examine measures implemented and their effectiveness in reducing energy consumption at mid-term. A plan could be developed to further implement the successful measures for other facilities.

Long Term Goal & CDM Plan Update

The UWSS will strive to reduce total system-wide energy consumption by 3-5% by the end of 2029 from the 2014 baseline.

The Energy Consumption and Greenhouse Gas (GHG) Emission template that is required to be submitted in 2026 will document the 2024 energy usage results. This template will show if the energy reduction target was achieved or not.

As with this plan update, the updated CDM Plan in 2029 will include the following items:



Annual Energy and GHG Emissions Reporting and Five-Year Plan Update

Ontario Regulation 25/23 requires that the UWSS report on the results of the CDM Plan at the end of the five-year planning period. As in this update, in the next update due in 2029, UWSS will provide an update to include any revisions to the 2025-2029 CDM Plan. UWSS has submitted and published all of its annual Energy and Greenhouse Emission Reports and will continue to do so annually until July 1, 2029. At that time, the revised Plan will provide:

- A description of current and proposed measures for conserving and otherwise reducing energy consumption and managing its demand for energy;
- A revised forecast of the expected results of the current and proposed measures;
- A report of the actual results achieved;
- A description of any proposed changes to be made to assist in reaching any targets established; and
- Any additional initiatives geared at achieving or establishing new targets.

Incentive Funding

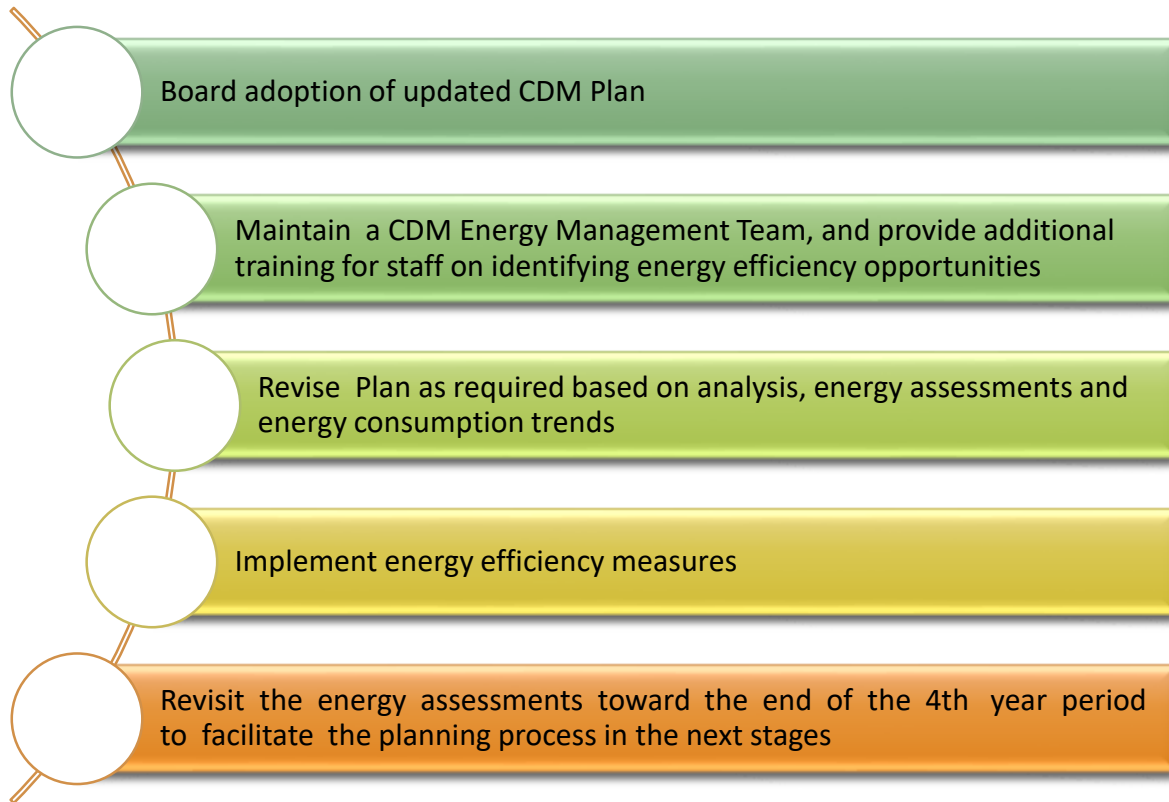
To ensure that UWSS will take advantage of all funding and grant opportunities related to energy efficient projects, UWSS will liaise with representatives from municipalities and local utility providers. UWSS staff and utility representatives are in a unique position to review current and future process improvements, program implementations and projects that can meet future funding requirements. As funding opportunities arise that are suitable for specific energy conservation projects, UWSS Staff will report to the Board of Directors and clearly outline the cost savings associated with a successful application.

Conclusions and Recommendations

Conclusions

- ✓ UWSS is on its way to the implementation of a structured Conservation Program
- ✓ UWSS plans to further investigate investment decisions in technologies to reduce electricity and natural gas expenditures and revise the current plan where appropriate
- ✓ Reasonable reductions must be targeted based on analysis through facility assessments
- ✓ A structured implementation framework will be followed to ensure the success of the CDM initiative

Recommendations



Schedule 1:
Actual 2014-2022 Energy Consumption and
Energy Intensities with Associated GHG
Emissions

Energy Consumption Profile and Variance

The following tables show the change in electricity and natural gas consumption and intensities at all of the UWSS' facilities over the last eight years. A lot of changes have occurred to the UWSS' facilities over the last five years, many of which resulted in energy efficiencies and consumption reductions. That said, even though a facility may have experienced a significant increase in energy consumption, the change in annual flow must be accounted for when evaluating energy consumption at the facilities. Reviewing the energy consumption values for the UWSS facilities and comparing the results of 2018 to 2022, the increase in the energy consumption ranged from 24 to 45%. Low lift experienced the largest increase of 45%, Ruthven WTP followed at 35%, and Cottam booster increased by 24%. As you can see in the figures below, total annual electricity and natural gas consumption may have increased at some of the facilities over the years, however, when analyzing the quantity of electricity and natural gas consumed per unit of flow (energy intensity), it is evident that the facilities' energy efficiencies have in fact improved since 2014. The only exception to the statement above is the Ruthven WTP that has exhibited an increase of 1.4% in the kWh/ML key performance indicator. The likely explanation is that the plant is beginning to process the water outside of the typical parameters due to higher than historic water demand, which in turn reduces the overall plant efficiency. It is to be noted that UWSS is aware of the increase in the water demand, and is actively pursuing water conservation projects, engaging the water uptake stakeholders in the service area, and introducing policies to reduce water use during peak season.

Table S-1: Electricity Consumption per Megalitre of Water Pumped (2014-2022)

Total Annual Electricity Consumption per Megalitre (kWh per ML)				
Facility	2014	2018	2022	2014-2022 Variance
Ruthven WTP	285	272	289	1.4%
Low Lift Pump Station	145	124	140	-3.2%
Cottam Booster Station	213	191	149	-30.0%
Total Average	215	196	209	-2.6%

Table S-3: Natural Gas Consumption per Megalitre of Water Pumped (2014-2022)

Total Annual Natural Gas Consumption per Megalitre (m ³ per ML)				
Facility	2014	2018	2022	2014-2022 Natural Gas Consumption Variance
Ruthven WTP	7.87	7.45	5.18	-34.2%
Low Lift Pump Station	0.74	0.69	0.59	-20.0%
Cottam Booster Station	7.19	6.08	4.67	-35.0%
Average	4.45	4.04	2.89	-35.2%

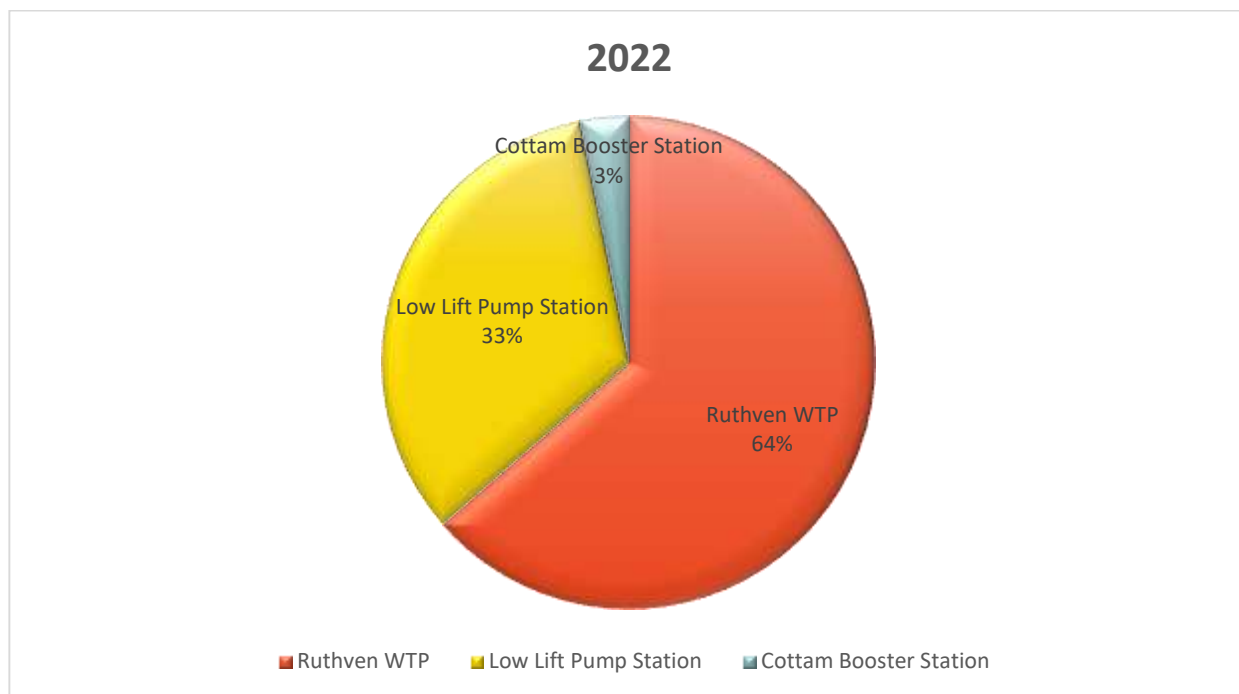


Figure S-1: 2022 UWSS ELECTRICITY Consumption Profile

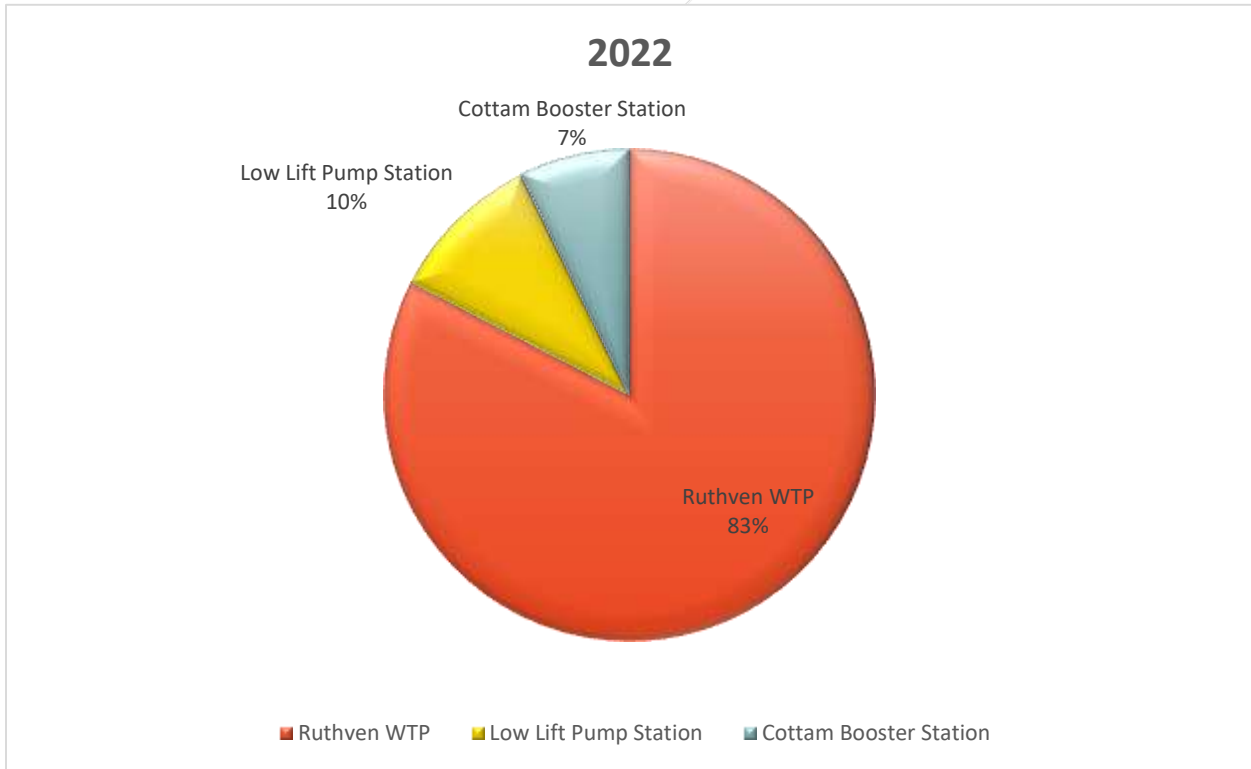


Figure S-2: 2022 UWSS NATURAL GAS Consumption Profile

Schedule 2:
Board Resolution Adopting 2024 CDM Plan
Update

To: UWSS Inc. Board of Directors
From: Rodney Bouchard, UWSS Inc. CEO
Date: June 13, 2024
Re: Update on Service Level Review of UWSS Inc.
Contracted Operations and Maintenance Services



Recommendation:

That the Union Water Supply System Inc. Board of Directors (Board) receives this report for information, and

That the Board approves the recommendation in Deloitte's **OCWA Vendor Assessment Report, May 27, 2024** to negotiate a new agreement between UWSS Inc. and OCWA for Operations and Maintenance services at UWSS Inc. facilities, and

That the Board approves a budget of \$75,000 for this work.

Background:

The UWSS Board retains the Ontario Clean Water Agency (OCWA) to operate and maintain UWSS facilities, including the Ruthven water treatment plant, Low Lift pumping plant, Cottam Booster Station, four water towers and the common asset watermains & valves. The existing Operations and Maintenance Agreement (OMA) between UWSS and OCWA is a Fixed Management Fee Agreement (aka Cost Plus Agreement) that took effect on July 1, 2019. The agreement was based on an initial term of 4 years and 6 months ending December 31st, 2023 with a 5-year renewal option. The initial term of the agreement has been extended to December 31st, 2024 to allow UWSS Inc. the opportunity to undertake a comprehensive review of OCWA Operations & Maintenance services for UWSS facilities.

The transition of UWSS from the Joint Board of Management structure to a Joint Municipal Services Corporation (MSC) provided a timely opportunity for the undertaking of a review of UWSS internal capital works, operational program delivery and contracted Operations and Maintenance services. The intent of the Service Level Review was to identify the best option for delivery of internal and contracted O&M services for UWSS facilities under the new UWSS Inc. corporate structure.

The review was developed to include the following components:

- Evaluation of O&M services currently provided by OCWA as per the existing OMA.
- Identification of O&M service delivery options for external contracted service delivery and internal "in-house" service delivery.
- Review of O&M service delivery at other water utilities and municipalities with similar size customer base as UWSS.

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- Evaluation and comparison of identified options using a risk assessment approach (e.g. operational and financial risks, etc).

The final deliverable of the Service Level Review will be a final comprehensive report that provides the following:

- Details the service level review methodologies.
- Provides recommendations on UWSS staffing requirements for delivery of capital projects and operational programs.
- Provides recommendations on preferred option for O&M service delivery for UWSS facilities.
- Provides a proposed implementation schedule for the recommended improvements/ alternatives.

Discussion:

UWSS Inc. administration retained Deloitte to complete the OCWA Vendor Assessment. As part of this assessment, Deloitte was tasked with the following:

- Evaluate the O&M services currently provided by OCWA as per the existing OMA.
- Identify O&M service delivery options for external contracted service delivery and internal “in-house” service delivery.
- Review of O&M service delivery at other water utilities and municipalities with including some that are under contract with OCWA, under contract with a third party entity other than OCWA, or complete these services in-house
- Evaluate and compare O&M service delivery options using a risk assessment approach (e.g. operational and financial risks, etc).
- Determine the best “value for money” option for O&M services at UWSS facilities;
- Identify high-level approach and key considerations on how to proceed with the recommended option

Deloitte prepared the OCWA Vendor Assessment Report, dated May 27, 2024. The Deloitte report summarizes the approach and methodology used for the vendor assessment, provides information on background research and details for the assessment, identifies and evaluates viable options for O&M services at UWSS, and provides recommendations and next steps.

The report recommends that UWSS Inc. undertake a renegotiation with OCWA for delivery of O&M Services. This renegotiation would result in a completely new O&M agreement with OCWA as opposed to a “renewal” or update of existing agreement. The new agreement would include Key Performance Indicators (KPIs) to evaluate performance, increased and improved reporting requirements, possible incentives, and re-evaluation of risk sharing.

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UWSS Inc. administration provided a copy of the Deloitte report to UWSS Inc. Board directors via email correspondence dated June 10th, 2024. Since the Deloitte report includes information of a sensitive nature, the Deloitte report is not attached to this report.

Closing Comments

UWSS Inc.'s administration recommends that the Board moves forward with the renegotiation of an O&M Agreement between UWSS Inc. and OCWA.

Respectfully submitted,



Rodney Bouchard, CEO
Union Water Supply System Inc.

/kmj