Johnson Controls Performance Contract Review

Introduction

This report is a brief recap of the Johnson Controls Inc. (JCI) phase one and phase two energy efficiency and renewable energy projects. It includes an assessment of how successful the implementation has been, as well as any outstanding issues or concerns as part of this effort. This report also summarizes the projects' total costs, repayment plan, and expected energy savings.

The City of La Crosse requested proposals for a performance contract to implement energy efficiency and renewable energy upgrades to its facilities in the summer of 2018. City officials selected JCI to identify projects that would pay for themselves based on the energy savings. JCI began developing phase one in December 2018 and entered into a performance contract with the City in April 2019. These projects were focused on lighting upgrades and deferred maintenance on boilers, chillers, and air handling units. Once JCI began phase one, they were quickly able to begin developing a second phase which built on a solar array feasibility study already completed by the City. The Common Council approved a change order to implement phase two in September 2019. City officials and JCI began discussing possible projects for phase three in July 2020.

How successful implementation has been

JCI has successfully implemented ten of twelve projects identified in phase one. They have also implemented three of five projects identified in phase two. While all thirteen implemented projects are saving energy costs now, their actual performance will be measured and verified once all the projects in each phase are completed, anticipated in December 2020.

Facility	*ECM ID*	*Energy Conservation Measure (ECM) Name*	*Status*
City Hall	ECM-1-LCCH	Replace Heating Plant	Completed Oct 2019
	ECM-2-LCCH	Replace Chiller	Completed May 2020
	ECM-4-LCCH	Retrofit Lighting to LED	Completed June 2019
	ECM-5-LCC	Solar PV Array	Re-design is Pending XCEL Energy Approval. Anticipated Completion Dec 2020.
La Crosse Center	ECM-1-LCC	Retrofit to LED	Completed Aug 2019
	ECM-1-LCC-ALT	Retrofit Parking Ramp Lighting to LED	Completed Aug 2019
	ECM-2-LCC	Replace VAV Terminals	Work starting Sept 2020. Completion Oct 2020
	ECM-3-LCC	Repair AHUs	Pending Approval of CO. Anticipated Completion Dec 2020.
	ECM-4-LCC	Solar PV Array	Completed July 2020
	ECM-5-LCC	Roof Replacement	Completed June 2020
Library	ECM-1-LCML	Replace and Reconfigure Cooling Plant	Completed May 2020
	ECM-2-LCML	Retrofit Lighting to LED	Completed July 2019
	ECM-3-LCML	Implement Demand Control Ventilation for AH-1	Completed July 2020
	ECM-4-LCML	Solar PV Array	Completed July 2020
MSC	ECM-2-LCMSC	Retrofit Lighting to LED	Completed July 2019
	ECM-3-LCMSC	Solar PV Array	Completed June 2020
City of La Crosse	ECM-99	JEM - Enterprise Management	In-Progress. Substantial completion Sept 2020 final completion Dec 2020

Outstanding Issues or Concerns

Facilities managers have had one issue arise regarding the implemented projects. There were concerns over increased water use by the City Hall chiller. As with the previous chiller, the new chiller uses well water which has no cost to the City other than the cost to pump the water through the system. Despite the water use, the system is generating the expected overall savings for the City. JCI's staff is working with the facility managers to minimize water use while still delivering on promised energy savings.

JCI and the City are working together to address issues that arose with the three project scope items that remain incomplete:

- City staff are in the process of getting a change order for the AHU and VAV projects for the La Crosse Center approved. This change order is in collaboration with the La Crosse Center Expansion and is the most efficient way of handling overall system upgrades.
- JCI and City staff are also working to overcome limitations to installing solar panels on City Hall due to special requirements of the Xcel Energy spot network. The City, JCI and Xcel Energy are working on an alternative design to create a special configuration that will work on the City Hall facility.
- The energy management dashboard is in progress as well; JCI and IT staff from the City and Library are working together to network, monitor, and report on the energy savings and renewable energy performance data.

Total Cost

The total cost of the performance contract is $5.9 million. Phase one was $4.3 million and phase two was $1.6 million. The City contributed $675,000 up front for phase one; no City contribution was required for phase two. The City contribution came from six funds – Xcel Energy credits, funding for the MSC's boiler replacement, two old promissory notes, unused funds from a disaster recovery site, and unallocated building capital funds. The remaining $5.2 million are divided into two equipment lease/purchase agreement loans, $3.6 million for phase one and $1.6 million for phase two. The $136,000 cost of change order for the La Crosse Center AHU and VAV terminals will be charged directly to the La Crosse Center expansion budget. Depending on the solution for City Hall's solar panels, there may be additional costs there to be determined.

Repayment Plan

While repayment for loans associated with performance contracts can ebb and flow to reflect actual savings, the City's Finance Director requests an even repayment. The City will be paying over $19,000 monthly for phase one and nearly $9,000 monthly for phase two projects, just over $28,000 total per month. Phase one's interest rate was 3.0%, but the City was able to refinance at a lower rate when it set up phase two, so both are at 2.4% currently.

Expected Energy Savings

The energy conservation measures taken through the projects are estimated to save the City $5.5 million in energy and $1.6 million in operations and maintenance costs over twenty years. The total first year cost savings were estimated at $269,000. While these savings will likely continue for years to come, they depend on electricity rates and upkeep of the equipment. As part of the performance contract, these savings will be measured and verified using industry standard practices for the first three years. JCI's energy manager dashboard will be able to provide an ongoing glimpse into the energy generation and savings over the life of the system as well.

Projected Savings (Year One) breakdown by Energy Conservation Measure (ECM)

Energy Conservation Measure (ECM)	Utility Savings	Utility Savings (non-measured)	Operational Savings	Allocation Towards Debt Service payment (yr. 1) from savings
ECM-1-LCCH Replace Existing Heating Plant	$ 7 ,672	$ -	$ -	$ 7,672
ECM-2-LCCH Replace Existing Chiller and Reconfigure Existing Chilled Water Plant	$ 9 ,606	$ -	$ 10,300	$ 19,906
ECM-4-LCCH Retrofit Lighting to LED	$ 7 ,922	$ -	$ 4,708	$ 12,630
ECM-5-LCCH City Hall PV Array	$ 19,667	$ -	$ -	$ 19,667
ECM-1-LCC Retrofit Lighting to LED	$ 56,193	$ -	$ 26,122	$ 82,315
ECM-1-LCC-ALT Retrofit Parking Ramp Lighting to LED	$ 14,768	$ -	$ 5,768	$ 20,536
ECM-2-LCC Replace VAV Terminals	$ -	$ 2,464	$ -	$ 2,464
ECM-3-LCC Repair Arena AHUs	$ -	$ -	$ -	$ -
ECM-4-LCC La Crosse Center PV Array	$ 21,157	$ -	$ -	$ 21,157
ECM-5-LCC La Crosse Center Roof Replacement	$ -	$ -	$ -	$ -
ECM-1-LCML Replace and Reconfigure Existing Cooling Plant	$ 8 ,877	$ -	$ -	$ 8,877
ECM-2-LCML Retrofit Lighting to LED	$ 16,745	$ -	$ 7,687	$ 24,432
ECM-3-LCML Implement Demand Controlled Ventilation for AH-1	$ -	$ 165	$ -	$ 165
ECM-4-LCML Main Library PV Array	$ 20,615	$ -	$ -	$ 20,615
ECM-2-LCMSC Retrofit Lighting to LED	$ 6 ,236	$ -	$ 4,588	$ 10,824
ECM-3-LCMSC Service Center PV Array	$ 17,810	$ -	$ -	$ 17,810
ECM-99 Install JEMS Kiosk System	$ -	$ -	$ -	$ -
Total ECM Items	**$ 207,269**	**$ 2,629**	**$ 59,173**	**$ 269,071**

Projected Savings (year one) breakdown by Building

Building	Utility Savings	Utility Savings (non-measured)	Operational Savings	Allocation Towards Debt Service payment (yr. 1) from savings	Estimated Utility Incentive Benefits
City Hall (LCCH)	$ 44,868	$ -	$ 15,008	$ 59,876	$ 44,514
La Crosse Center (LCC)	$ 77,350	$ 2,464	$ 26,122	$ 105,936	$ 96,615
La Crosse Center Parking Ramp (LCC-ALT)	$ 14,768	$ -	$ 5,768	$ 20,536	$ 21,257
Main Library (LCML)	$ 46,237	$ 165	$ 7,687	$ 54,089	$ 54,459
Municipal Service Center (LCMSC)	$ 24,046	$ -	$ 4,588	$ 28,634	$ 46,093
Total ECM Items	**$ 207,269**	**$ 2,629**	**$ 59,173**	**$ 269,071**	**$ 262,937**

The City has received nearly $173,000 in Focus on Energy and Xcel Energy incentives for the projects. Once complete, the total amount of incentives will add up to nearly $264,000, which is greater than estimated above. City staff is working with Focus on Energy and Xcel Energy to hold a virtual big check ceremony showing off the savings.

Project	Focus on Energy Incentive	Xcel Energy Incentives	Total Amount Received	Amount Remaining to Submit	Anticipated Final Amount
Lighting	$136,797.32	$20,000	$156,797.32	$ -	$156,797.32
City Hall Boilers	$12,000.00	$4,000	$16,000.00	$ -	$16,000.00
City Hall Chiller	$12,120.63	$4,000	TBC	$ -	$16,120.63
Library Chiller	$7,256.25	$3,628.13	TBC	$ -	$10,884.38
Photovoltaics	$47,955.00	$0	TBC	$15,985.00	$63,940.00
Total	**$216,129.20**	**$31,628.13**	**$172,797.32**	**$15,985.00**	**$263,742.33**

Conclusion

Over the past two years, the City of La Crosse has worked with Johnson Controls to identify energy efficiency and renewable energy projects that will be paid off by the savings they provide. New lights, chillers, boilers, and air handling units provide greater energy efficiency and solar arrays let the City generate its own power. City funds and equipment lease/purchase agreements to pay for $5.9 million dollars in projects that will return $7.1 million in energy, operations, and maintenance savings. In the first year of operation, the City should show nearly $267,000 in energy savings and almost $264,000 in incentives, while paying $336,000 for the loan. There are a few projects left to complete, ideally by the end of 2020. Once these are in place, the City will be able to show off it's progress in JCI's energy management dashboards and their measures and verifications reports.