EMC
ENERGY MANAGEMENT CONSULTANTS INC.

High Performance Lighting Improvement Project Prepared for

Town of Madison

Madison, NH

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Carl Edin
August 23, 2016

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August 23, 2016

Ms. Linda Farinella
Town of Madison
1923 Village Road
Madison NH 03849

Re: 2016 High Performance Lighting Improvement Project

Dear Linda,

Enclosed you will find our turnkey energy saving lighting proposal.

By implementing these cost savings measures the Town of Madison will achieve the following benefits:

- Reduced operating cost
- Reduced owning cost by removing inefficient HID and T12 technology along with standard T8 technology
- Utilization of high efficiency LED technology
- Standardization of lighting components
- Improved light quality and quantity
- Eversource Incentive (pending approval)
- Excellent payback/ROI

We look forward to working with you to reach your goals of lighting improvements and energy conservation. After reviewing, please contact me at (207) 767-1313 or (207) 400-4767 to answer any questions.

Sincerely,

Carl Edin
Project Developer
Project Manager

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Benefits of a Turnkey Lighting Upgrade

- Complete cost analysis: room by room survey of existing system compared to a new proposed system, providing kW and kWh savings projections
- Product specification: high efficiency equipment being specified to reduce energy and maintenance cost
- Turnkey Installlation/Project Management:
  - Providing detailed information of work to be completed
  - Overseeing of Installation with sub-contractors
  - Proper disposal of all waste-(hazardous and non-hazardous) with certificates of recycling provided
  - Weekly updates-communication with customer on progress of project completion
  - Pre and Post walkthrough's with Eversource for final approvals
- Customer benefits:
  - With the exception of scheduling, Town of Madison will be able to focus on other pressing matters.
  - Cost savings will be achieved in a much quicker time frame

Warranty information

Lamps	3-5 years
Ballast	5 years
Fixtures	1-10 years
Labor	90 days
Labor Workmanship	1 year

EMC's Assurance

As a "turnkey" Energy Service Company, (ESCo) EMC will design and project manage the installation of proven energy saving technologies as well as provide periodic follow up to assure complete customer satisfaction.

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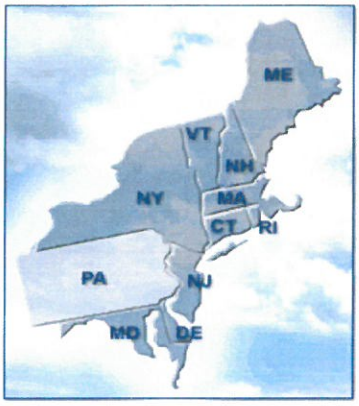

Environmental Impact
August 2016

The **24,442** ***kWh*** saved annually by this project equates to the following positive environmental impacts:

- **2 households** is the average number of houses that can now be powered from this project. The average U.S. household consumes 11,280 kWh annually.

- **1,686 fewer gallons of oil** need to be imported, reducing our dependence on foreign oil.

- **15 tons of CO_2**
  Carbon Dioxide is considered a greenhouse gas and is a major contributor to global warming.

- **295 lbs of SO_2**
  Sulfur Dioxide- some major health effects associated with this pollutant are: asthma, respiratory illness and aggravation of existing cardiovascular disease.

- **151 lbs. of Nox**
  Nitrogen Oxides are considered contributors to acid rain and ground level ozone (or smog).

- **10 lbs. of visible particulate**

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Supporting Information

Room by Room Savings Analysis

DPW

Fire Department

Highway Garage

Library

Town Hall

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Madison DPW

Room by Room Savings Analysis

Line	Room	EMC CM Code	Count	Hours/Week	Hours/Year	Curr kW	Curr I/W	Curr Watts	Prop kW	Prop I/W	Prop Watts	kWh Svgs
001	1FL- Garage	I2L8HO/RILED4L4-8F-14.5-N-KIT	7	40/42	1680	1.66	237.00	1659.00	0.41	58.00	406.00	2105.04
002	1FL- Garage	I2L8HO/RILED4L4-8F-14.5-N-KIT	8	20/42	840	1.90	237.00	1896.00	0.46	58.00	464.00	1202.88
003	1FL- PO 1	S2L4-T8/LED2L4-12-L-RETRO	1	40/42	1680	0.06	60.00	60.00	0.02	24.00	24.00	60.48
004	1FL- RR	PS75/LED11A-NL	1	20/42	840	0.08	75.00	75.00	0.01	11.00	11.00	53.76
005	1FL- Garage	I2L4/LED2L4-12-L-RETRO	1	40/42	1680	0.08	80.00	80.00	0.02	24.00	24.00	94.08
006	Ext- Front	YL175MH/YLLED40-NF	1	84/52	4368	0.21	205.00	205.00	0.04	40.00	40.00	720.72
007	Ext- Front	WP250MH/WPLED57-PE-NF	1	84/52	4368	0.30	295.00	295.00	0.06	57.00	57.00	1039.58
			20			**4.27**			**1.03**			5276.54
									3.24			

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Madison Fire Department

Room by Room Savings Analysis

Line	Room	EMC CM Code	Count	Hours/Week	Hours/Year	Curr kW	Curr I/W	Curr Watts	Prop kW	Prop I/W	Prop Watts	kWh Svgs
001	Ext- Front	YL250MH/YLLED40-NF	1	84/52	4368	0.30	295.00	295.00	0.04	40.00	40.00	1113.84
002	Ext- Front	WP70S-PE/WPLED21-PE-NF	1	84/52	4368	0.09	90.00	90.00	0.02	21.00	21.00	301.39
003	Ext- Flag	FL75PAR38/LED15PAR38-NL	1	84/52	4368	0.08	75.00	75.00	0.02	15.00	15.00	262.08
004	Ext- Front	FL500H/REMAIN	2	0	0	1.00	500.00	1000.00	1.00	500.00	1000.00	0.00
005	1FL- Fire Bays	S2L8/RSLED4L4-8F-12-L-KIT	15	20/52	1040	2.07	138.00	2070.00	0.72	48.00	720.00	1404.00
006	1FL- RR 1	W2L4-T8/LED2L4-12-L-RETRO	1	10/52	520	0.06	60.00	60.00	0.02	24.00	24.00	18.72
007	1FL- Kitchen	S2L8/RSLED4L4-8F-12-L-KIT	1	10/52	520	0.14	138.00	138.00	0.05	48.00	48.00	46.80
008	1FL- Training RM	P3L4-T8/RKLED2L4-12-L-KIT	8	20/52	1040	0.70	88.00	704.00	0.30	37.00	296.00	424.32
009	1FL- Chief	S2L8/RSLED4L4-8F-12-L-KIT	1	20/52	1040	0.14	138.00	138.00	0.05	48.00	48.00	93.60
010	1FL- Stg	S2L8/RSLED4L4-8F-12-L-KIT	1	5/52	260	0.14	138.00	138.00	0.05	48.00	48.00	23.40
			32			**4.71**			**2.26**			3688.15
									2.45			

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Madison Highway Garage

Room by Room Savings Analysis

Line	Room	EMC CM Code	Count	Hours/Week	Hours/Year	Curr kW	Curr I/W	Curr Watts	Prop kW	Prop I/W	Prop Watts	kWh Svgs
001	Ext- Front	YL250MH/YLLED40-NF	1	84/52	4368	0.30	295.00	295.00	0.04	40.00	40.00	1113.84
002	Ext- Front	WPLED/REMAIN	1	84/52	4368	0.00	0.00	0.00	0.00	0.00	0.00	0.00
003	1FL- Garage	LB400MH/HBLED4-88-NF	4	25/52	1300	1.82	455.00	1820.00	0.35	88.00	352.00	1908.40
004	1FL- Garage	I2L8/RILED4L4-8F-12-L-KIT	1	25/52	1300	0.14	138.00	138.00	0.05	48.00	48.00	117.00
005	1FL- Garage	S1L4-T8/LED1L4-12-L-RETRO	2	25/52	1300	0.06	30.00	60.00	0.02	12.00	24.00	46.80
006	1FL- Garage	S2L8/RILED4L4-8F-12-L-KIT	4	25/52	1300	0.55	138.00	552.00	0.19	48.00	192.00	468.00
007	1FL- Garage	S1L4-T8/LED1L4-12-L-RETRO	4	25/52	1300	0.12	30.00	120.00	0.05	12.00	48.00	93.60
008	1FL- Garage	S2L8HO/RILED4L4-12-L-KIT	2	25/52	1300	0.47	237.00	474.00	0.10	48.00	96.00	491.40
009	1FL- Garage	S2L8HO/RILED4L4-12-L-KIT	2	25/52	1300	0.47	237.00	474.00	0.10	48.00	96.00	491.40
010	1FL- Madison TV	LOCKED	1	10/52	520	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			22			**3.93**			**0.90**			4730.44
									3.04			

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Madison Library

Room by Room Savings Analysis

Line	Room	EMC CM Code	Count	Hours/Week	Hours/Year	Curr kW	Curr I/W	Curr Watts	Prop kW	Prop I/W	Prop Watts	kWh Svgs
001	LL- Meeting	W2L4-T8/LED2L4-12-L-RETRO	17	5/52	260	1.02	60.00	1020.00	0.41	24.00	408.00	159.12
002	LL- Hall	W2L4-T8/LED2L4-12-L-RETRO	1	5/52	260	0.06	60.00	60.00	0.02	24.00	24.00	9.36
003	LL- RR 1	FAN60/REMAIN	1	5/52	260	0.06	60.00	60.00	0.06	60.00	60.00	0.00
004	LL- Stg	W2L4-T8/LED2L4-12-L-RETRO	2	5/52	260	0.12	60.00	120.00	0.05	24.00	48.00	18.72
005	LL- Friends Stg	W2L4-T8/LED2L4-12-L-RETRO	4	5/52	260	0.24	60.00	240.00	0.10	24.00	96.00	37.44
006	LL- Library Stg	W2L4-T8/LED2L4-12-L-RETRO	4	5/52	260	0.24	60.00	240.00	0.10	24.00	96.00	37.44
007	LL- Closet	W2L4-T8/LED2L4-12-L-RETRO	1	5/52	260	0.06	60.00	60.00	0.02	24.00	24.00	9.36
008	Stairs	W2L4-T8/LED2L4-12-L-RETRO	2	5/52	260	0.12	60.00	120.00	0.05	24.00	48.00	18.72
009	1FL- Childrens	PM4L4-8F-T8/LED4L4-8F-12-L-RETRO	6	34/52	1768	0.67	112.00	672.00	0.29	48.00	288.00	678.91
010	1FL- Main	PM4L4-8F-T8/LED4L4-8F-12-L-RETRO	14	34/52	1768	1.57	112.00	1568.00	0.67	48.00	672.00	1584.13
011	1FL- Main	PM2L4-T8/LED2L4-12-L-RETRO	2	34/52	1768	0.12	60.00	120.00	0.05	24.00	48.00	127.30
012	1FL- RR 1	FAN60/LED7A-NL	1	15/52	780	0.06	60.00	60.00	0.01	7.00	7.00	41.34
013	1FL- Vestibule	RC18CFR30/LED11R30-NL	2	34/52	1768	0.04	20.00	40.00	0.02	11.00	22.00	31.82
014	Ext- Entry	WM2L25CH/LED2L2CH-NL	3	20/52	1040	0.15	50.00	150.00	0.01	4.00	12.00	143.52
015	Ext- Entry	FL2L18PAR38-MS/LED2L15PAR38-NL	1	84/52	4368	0.04	40.00	40.00	0.03	30.00	30.00	43.68
016	Ext- Entry	FL2L75PAR38/LED2L15PAR38-NL	1	20/52	1040	0.15	150.00	150.00	0.03	30.00	30.00	124.80
017	Ext- Entry	FL175MH/FFLED41-NF	1	84/52	4368	0.21	205.00	205.00	0.04	41.00	41.00	716.35
018	Ext- Side	WM3L25CH/LED3L2CH-NL	2	20/52	1040	0.15	75.00	150.00	0.01	6.00	12.00	143.52
019	Ext- Side	WP70MH/WPLED20-NF	1	84/52	4368	0.10	95.00	95.00	0.02	20.00	20.00	327.60
			66			**5.17**			**1.99**			4253.13
									3.18			

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Madison Town Hall

Room by Room Savings Analysis

Line	Room	EMC CM Code	Count	Hours/Week	Hours/Year	OS Type	Curr kW	Curr I/W	Curr Watts	Prop kW	Prop I/W	Prop Watts	kWh Svgs
001	LL- RR 1	RC14CF/LED7A-NL	1	5/52	260		0.02	16.00	16.00	0.01	7.00	7.00	2.34
002	LL- Open	RC14CF/LED7A-NL	8	10/52	520		0.13	16.00	128.00	0.06	7.00	56.00	37.44
003	LL- PD	LOCKED	1	30/52	1560		0.00	0.00	0.00	0.00	0.00	0.00	0.00
004	LL- Meeting	P2L2U6-T8/RKLED2L2-9-L-KIT	8	20/52	1040		0.48	60.00	480.00	0.14	18.00	144.00	349.44
005	LL- Vault	LOCKED	1	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00
006	LL- Stair 1	W2L4-25/LED2L4-12-L-RETRO	1	32/52	1664		0.08	80.00	80.00	0.02	24.00	24.00	93.18
007	1FL- Vestibule 1	RC14CF/LED7A-NL	2	32/52	1664		0.03	16.00	32.00	0.01	7.00	14.00	29.95
008	1FL- Town Clerk	P3L4-T8/LED3L4-12-L-RETRO	5	32/52	1664		0.44	88.00	440.00	0.18	36.00	180.00	432.64
009	1FL- Trash	RC14CF/LED7A-NL	1	5/52	260		0.02	16.00	16.00	0.01	7.00	7.00	2.34
010	1FL- Corr 1	P3L4-T8/LED3L4-12-L-RETRO	4	32/52	1664		0.35	88.00	352.00	0.14	36.00	144.00	346.11
011	1FL- Corr 1	RC14CF/LED7A-NL	1	32/52	1664		0.02	16.00	16.00	0.01	7.00	7.00	14.98
012	1FL- Town Admin	P3L4-T8/LED3L4-12-L-RETRO	3	32/52	1664		0.26	88.00	264.00	0.11	36.00	108.00	259.58
013	1FL- Town Stg	PS75I/LED7A-NL	1	5/52	260	EMS	0.08	75.00	75.00	0.01	7.00	7.00	17.68
014	1FL- RR 1	P3L4-T8/LED3L4-12-L-RETRO	1	10/52	520		0.09	88.00	88.00	0.04	36.00	36.00	27.04
015	1FL- RR 1	RC65R30/LED7A-NL	1	10/52	520		0.07	65.00	65.00	0.01	7.00	7.00	30.16
016	1FL- Kitchen	RC65R30/LED7A-NL	2	10/52	520		0.13	65.00	130.00	0.01	7.00	14.00	60.32
017	1FL- Town Selectman	P3L4-T8/LED3L4-12-L-RETRO	3	32/52	1664		0.26	88.00	264.00	0.11	36.00	108.00	259.58
018	1FL- Accounting	P3L4-T8/LED3L4-12-L-RETRO	2	32/52	1664		0.18	88.00	176.00	0.07	36.00	72.00	173.06
019	1FL- Front Stair	W2L4-T8/LED2L4-12-L-RETRO	3	32/52	1664		0.18	60.00	180.00	0.02	24.00	20.00	266.24
020	2FL- Stg	REMAIN	1	5/52	260		0.00	0.00	0.00	0.00	0.00	0.00	0.00
021	Ext- Back Entry	RC14CF/LED7A-NL	1	84/52	4368		0.02	16.00	16.00	0.01	7.00	7.00	39.31
022	Ext- Back Entry	FL2L100H-MS/FFLED2L22-MS-NF	1	40/52	2080		0.20	200.00	200.00	0.02	44.00	20.00	374.40
023	Ext- Right Side	WP70S-PE/WPLED15-PE-NF	1	84/52	4368		0.09	90.00	90.00	0.02	15.00	15.00	327.60
024	Ext- Front Flag	FL100S/FLLED22-NF	1	84/52	4368		0.13	130.00	130.00	0.02	22.00	22.00	471.74
025	Ext- Front Entry	PM60/LED7A-NL	1	20/52	1040		0.06	60.00	60.00	0.02	7.00	20.00	41.60
026	Ext- PD Entry	FL2L75PAR38/LED2L15PAR38-NL	4	40/52	2080		0.60	150.00	600.00	0.12	30.00	120.00	998.40
027	Ext- PD Entry	RC14CF/LED7A-NL	1	84/52	4368		0.02	16.00	16.00	0.01	7.00	7.00	39.31
028	Ext- Monument Flag	FL100S/FLLED22-NF	2	84/52	4368		0.26	130.00	260.00	0.02	22.00	20.00	1048.32
026	Ext- Monument	FL50S/FFLED22-NF	4	84/52	4368		0.26	65.00	260.00	0.09	22.00	88.00	751.30
			66				**4.43**			**1.27**			6494.07
										3.16			

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Financial Investment

Cost Savings Analysis

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Town of Madison

Cost Savings Summary

Prepared by Carl Edin

August 23, 2016

Area	Savings		Maint	Energy	Total	Project	Estimated Eversource	Net Project	Payback	ROI
	kW	kWh	Savings	Savings	Savings	Cost	Incentive	Cost		
DPW	3	5,277	$ 100.00	$ 897.09	$ 997.09	$ 4,451.00	$ 2,225.50	$ 2,225.50	2.23	44.8%
Library*	3	4,253	$ 325.00	$ 676.23	$ 1,001.23	$ 8,232.00	$ 900.00	$ 7,332.00	7.32	13.7%
Fire Department*	2	3,688	$ 150.00	$ 564.26	$ 714.26	$ 5,187.00	$ 495.00	$ 4,692.00	6.57	15.2%
Highway Garage	3	4,730	$ 100.00	$ 785.18	$ 885.18	$ 4,368.00	$ 2,184.00	$ 2,184.00	2.47	40.5%
Town Hall*	3	6,494	$ 315.00	$ 1,032.55	$ 1,347.55	$ 8,682.00	$ 670.00	$ 8,012.00	5.95	16.8%
Total	**14**	**24,442**	**$ 990.00**	**$ 3,955.31**	**$ 4,945.31**	**$ 30,920.00**	$ 6,474.50	**$ 24,445.50**	**4.94**	**20.2%**

Notes:

1. Blended rate varies from $.153-$.170/kWh
2. Eversource Incentives to be applied for
3. * indicated prescriptive incentives

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SEAL OF THE TOWN OF MADISON, NEW HAMPSHIRE 1852

Project Process Recap

- ✓ EMC to attain electric bills
- ✓ EMC to complete site survey
- ✓ EMC to generate cost-savings proposal
- o EMC to submit applications to Eversource for incentive approvals
- o Town of Madison to sign EMC T&C and Eversource Customer Agreements
- o EMC to construct project
- o EMC to coordinate post-utility walkthrough
- o EMC to provide Town of Madison with warranty book

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