

Randolph Electric Membership Corporation
SB3 Compliance
Program Pilot
Commercial/Industrial Energy Efficiency
Lighting

April 19, 2010

Table of Contents

Page

Program overview..... 3

Incentives.....3

Measurement/Verification.....3

Example.....4

Program Overview (pilot)

Randolph Electric Membership's Commercial/ Industrial Energy Efficiency Lighting Program is designed to encourage non-residential members to implement energy efficient measures with regard to facility lighting. It is intended that information gained from this "pilot program" be used to further develop cost effective incentives and performance standards related to commercial/industrial energy efficiency. Resulting energy reduction is to be used in meeting standards as required by North Carolina's Senate Bill 3.

Incentives

For qualifying projects an incentive of \$0.30/watt will be offered to those commercial/industrial members who can demonstrate replacement of existing lighting equipment with new energy efficient lighting technology. The incentive paid to the REMC member is not to exceed an average REC price that would be considered reasonable based on other energy efficiency projects. Realizing that the price per REC will vary based on the technology, price and the members system load factor. Given the variables involved it is recommended that a cap be set for lighting incentives based on a maximum price per REC of \$8.00 using 15 years as the expected lifespan of standard equipment. Members utilizing the incentive paid by REMC must maintain the energy efficient equipment in place for a minimum of five years unless upgrading to a more efficient technology. Members replacing energy efficient equipment in less than five years will be required to repay a prorated portion of the incentive back to the cooperative.

Measurement / Verification

It is required that all technical design be developed by a qualified party having experience in the field of lighting design. The lighting design will be provided to REMC staff for final approval and shall include *General Energy Savings Calculations*.

General Energy Savings Calculations:

Base Case Lighting kW = (# base case fixtures x input wattage per fixture x fractional percentage of fixtures operating) / (1,000 Watts/kW)

Base Case Lighting kWh = (Base Case Lighting kW x annual operating hours)

Post Retrofit Lighting kW = (# post retrofit fixtures x input wattage per fixture x fractional percentage of fixtures operating) / (1,000 Watts/kW)

Post Retrofit Lighting kWh = (Post retrofit Lighting kW x annual operating hours)

Annual kWh Savings = (Base Case Lighting kWh - Post Retrofit Lighting kWh)

Pre- and post-retrofit operation hours are the same in general, however if the project includes control technologies such as, occupancy sensors or timers lower hours of operation will result.

Example

Sapona Plastics kWh Savings for Re-lamping

400 Watt Metal Halide	# of Lights	Watts/Fix.	kW	Hrs./Yr.	kWh per Year
Production Area	66	0.458	30.23	8760	264797.28
Warehouse	41	0.458	18.78	8760	164495.28
Biomedical Room	8	0.458	3.664	8760	32096.64
Total	115		52.67		461,389.20

6/32Watt T-8 HIF Lighting	# of Lights	Watts/Fix	kW	Hrs./Yr.	kWh per Year
Production Area	66	0.216	14.256	8760	124882.56
Warehouse	41	0.216	8.86	8760	77578.56
Biomedical Room	8	0.216	1.728	8760	15137.28
Total	115		24.84		217,598.40
Difference					243,790.80

T-12/32w	# of Lights	Watts/Fix	KW	Hrs./Yr.	KWh per Year
Office Area	96	0.034	3.264	8760	28592.64
Tool Shop	20	0.034	0.68	8760	5956.8
Break Room	76	0.034	2.584	8760	22635.84
Warehouse (Work Place)	24	0.034	0.816	8760	7148.16
Compressor Room	8	0.034	0.272	8760	2382.72
Bathrooms(Office)	34	0.034	1.156	8760	10126.56
Office Area(Entrance from P.A.)	8	0.034	0.272	8760	2382.72
Misc. Lighting	22	0.034	0.748	8760	6552.48
Total	288		9.792		85,777.92
Reduction Going to T-8					21,444.48

Base Case Lighting kW = (# base case fixtures x input wattage per fixture x fractional percentage of fixtures operating) / (1,000 Watts/kW)

Base Case Lighting kW = (115 x 458 x 100%)/1000 + (288 X 34 X 100%)/1000

Base Case Lighting kW = 52.67 kW +9.8 kW = 62.47 kW

Base Case Lighting kWh = (Base Case Lighting kW x annual operating hours)

Base Case Lighting kWh = (62.47 kW X 8760 hrs)

Base Case Lighting kWh = 547,237 kWh

Post Retrofit Lighting kW = (# post retrofit fixtures x input wattage per fixture x fractional percentage of fixtures operating) / (1,000 Watts/kW)

Post Retrofit Lighting kW = (115 x 216 x 100%)/1000 + (288 X 8.5 X 100%)/1000

Post Retrofit Lighting kW = (24.8 kW + 2.4 kW) = 27.2 kW

Post Retrofit Lighting kWh = (27.2 x 8760) = 238,272kWh

Annual kWh Savings = (Base Case Lighting kWh - Post Retrofit Lighting kWh)

Annual kWh Savings = (547,237 - 237,272)

Annual kWh Savings = 308,965 kWh or 309 REC/year

Incentive = (Base Watts –Post-retrofit Watts) x \$0.30

Incentive = (62.47 – 27.2) X 1000 X \$0.30 = \$10,581.00

Total RECS = 309 RECs/year x 15 years = 4635 RECS

Cost/ REC = \$10,581/ (309 RECs x 15 yrs) = \$2.28/REC