Appendix 3 – Technical Summary

In trying to keep up with technology as a means of energy and maintenance savings we have altered our standard equipment as improvements come onto the market.

Light sources have been the main focus of innovation, the details below indicate the changes over the years and the consumption for each type that has formed a major part of our energy saving measures.

70w Son with standard gear :- 91watts - 7945 units
70w Son with electronic gear :- 79 watts - 1289 units
45w Cosmopolis (white light) :- 51watts - 1861 units
24w LED lantern (white light) :- 24watts
19w LED lantern (white light) :- 19watts (current spec.)

The above quantities indicate the number of units for each light source currently in place in residential areas, converting 70w Son lanterns on standard gear to 19w LED would provide a reduction of 79% in consumption and energy costs.

The use of white light to illuminate the highway allows us to reduce lighting levels to produce the same perception to the road user. For the last 6 years all replacement lanterns uses a white light source reducing the circuit wattage from 91w to 51w and now 19w with LED.

Solar powered bollards are now used for all replacements, capital schemes and new developments thus consuming no energy.

All sign lights used are now LED consuming up to 60% less energy than previous

Photo electric cells (PEC's) are used to switch street lights on and off by reacting to light levels factory set within the unit, we have altered these settings from 70/35 to 35/18 which is known as trimming The new settings mean that street lights switch on later in the evening and switch off earlier in the morning reducing the operating hours per street light by around 30 mins per day.

The graph in Appendix 4 shows the reduction in street lighting energy usage of approximately 30% over the past 5 years even though the street lighting assets have increased by around 2.5% in that time due to new developments and capital schemes.

As well as replacement lanterns during maintenance, capital schemes and new developments within Torbay are now designed using LED technology.

With reference to the various light sources indicated above, this project will only look at the 70w Son lanterns both conventional gear and electronic gear where maximum savings can be achieved.

Calculations in this report are based on the existing 19w LED maintenance lantern using our experiences and consultation with lantern manufacturers to provide the best solution for both the Council and residents of Torbay.

It is possible to profile the drivers that control the power of the LED's to reduce the wattage at various times to suit site requirements, once installed a site visit is required to re-profile.

Due to the way PEC's operate for part night lighting, profiling of the drivers can not be achieved with part night lighting, all the proposals offered therefore use all night lighting where by selecting the right profile will add very little cost and energy consumption to a part night unit as detailed below. For these calculations the following figures are used.

Average burning hours based on a yearly consumption = 11.5hrs per night
Wattage of new lantern = 19watts.
Part Night lighting lanterns burn for 6.5 hours per night.
Advances in LED technology as indicated by lantern manufacturers.
Current energy rate is 12.6p/Kwh.
An all night lantern is lit for 4197hrs per year, part night 2300hrs.
The profile of the new lantern will commence at 17w,dim down to 12w at 10am then to 8w at 12.30am to 6am. (average wattage per night = 11.27)

Part Night Lighting Costs:

$\frac{19w \times 2300hrs \times 0.126p}{1000}$ = £5.50 energy cost per unit per year.

All night Lighting Costs ;

$\frac{11.27w \times 4197hrs \times 0.126p}{1000}$ = £5.95 energy cost per unit per year.

The calculations above show that to provide the residents and visitors of Torbay with all night lighting it will only cost 45p a year more i.e. 0.12p per unit per night.