SIEMENS

Investment Information

NetworkRail

What's happening?

Best Practice on *TLP KO2*

IN-USE ENERGY PROFILING - SIGNALLING EQUIPMENT

Overview:

Siemens Rail Automation (SRA) has set a target of 5% emission reduction for the Thameslink project on **in-use energy** baseline levels. LL09 annual in-use emissions have been calculated as 177,484 kg CO2-equivalent. Total project in-use emissions will be approximately 845,678 kg CO2-e.

Method:

To better direct our efforts and target the most energy intensive signaling equipment, a profile of each piece of kit was required. Power loadings (voltage amps) were obtained from SRA Power Engineers for each piece of equipment (see Figure 1) and a calculation was used to convert voltage amps (i.e. watts) to kilowatt hours, then kg CO2-e using DEFRA emission factor for the UK grid (0.49426).

This gave a list of what pieces of equipment consume the most *individually*, i.e. if you had one item of each piece of kit, which are the most energy intensive to run (see Figure 2). The AWS suppressor, point battery charger and EBI 400 track circuit TX are the top three consumers, and have therefore been selected as target areas for operational (Scope 2) emission reduction.

The next step was to determine which pieces of equipment are consuming the most *on Thameslink*. This involved obtaining the Bill of Materials to see how many of each piece of equipment was being ordered for the project, and multiplying quantities with kgCO2-e. See Figure 3 for a diagrammatic representation.

Meeting Objectives and Targets

This initiative aligns with the TLP Sustainability Strategy *Objective 15* 'to minimise the levels of carbon generated over the whole life of TLP' and associated TLP Delivering Carbon Emissions Reduction Policy.

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Figure 1. Raw data

Equipment Type	(a) Power consumption (VA = watt)	(b) kWh (a*18/1000)	(c) kWh per year (b*365)	(d) kgCO2-e per day (c*0.49426)	(e) kgCO2-e per year (d*365)	(f) Quantity ordered - Thameslink	kg CO2-e per year (e*f)
AWS Suppressor (Green) NEW VORTOK STYLE	295.0	5.3	1,938.2	2.6	958	121	115,912
Point Battery Charger (5A)	220.0	4.0	1,445.4	2.0	714	0	0
EBI 400 Track Circuit TX	180.0	3.2	1,182.6	1.6	585	780	455,919
AWS (Green) NEW VORTOK STYLE	140.0	2.5	919.8	1.2	455	252	114,564
LED Position Light Junction Indicator (PLJI)	135.0	2.4	887.0	1.2	438	47	20,604
LED Shunt (Independent Position Light)	60.0	1.1	394.2	0.5	195	192	37,409
CDRA	60.0	1.1	394.2	0.5	195	34	6,624
LED Limit of Shunt (LOS)	60.0	1.1	394.2	0.5	195	2	390
LED Subsidary (PL)	60.0	1.1	394.2	0.5	195	0	0
LED Standard Alphanumeric Route Indicator	55.0	1.0	361.4	0.5	179	19	3,393
LED Miniature Alphanumeric Route Indicator	55.0	1.0	361.4	0.5	179	14	2,500
LED Banner Repeater	35.0	0.6	230.0	0.3	114	9	1,023
Signal 4 Aspect (LED)	30.0	0.5	197.1	0.3	97	303	29,518
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Signal 1 Aspect (LED)	30.0	0.5	197.1	0.3	97	4	390
LOD unit	30.0	0.5	197.1	0.3	97	0	0
Signal 2 Aspect (LED)	30.0	0.5	197.1	0.3	97	0	0
2 x Case lamps/Loc Heater	24.0	0.4	157.7	0.2	78	0	0
Points Machines/Relays	20.0	0.4	131.4	0.2	65	15	974
1 x TFM (Signal or Points)	18.0	0.3	118.3	0.2	58	0	0
EBI 400 Track Circuit RX	15.0	0.3	98.6	0.1	49	810	39,455
TPWS TSS & OSS	12.0	0.2	78.8	0.1	39	279	10,872
TPWS TSS	12.0	0.2	78.8	0.1	39	109	4,247
Buffer Stop OSS (Miniature)	12.0	0.2	78.8	0.1	39	2	78
Track Circuit Interrupter	6.0	0.1	39.4	0.1	19	10	195
DLM pairs	4.0	0.1	26.3	0.0	13	34	442

Figure 2. In-use Energy Profiling - Equipment specific (if you ordered one piece of each equipment, largest to smaller consumers)

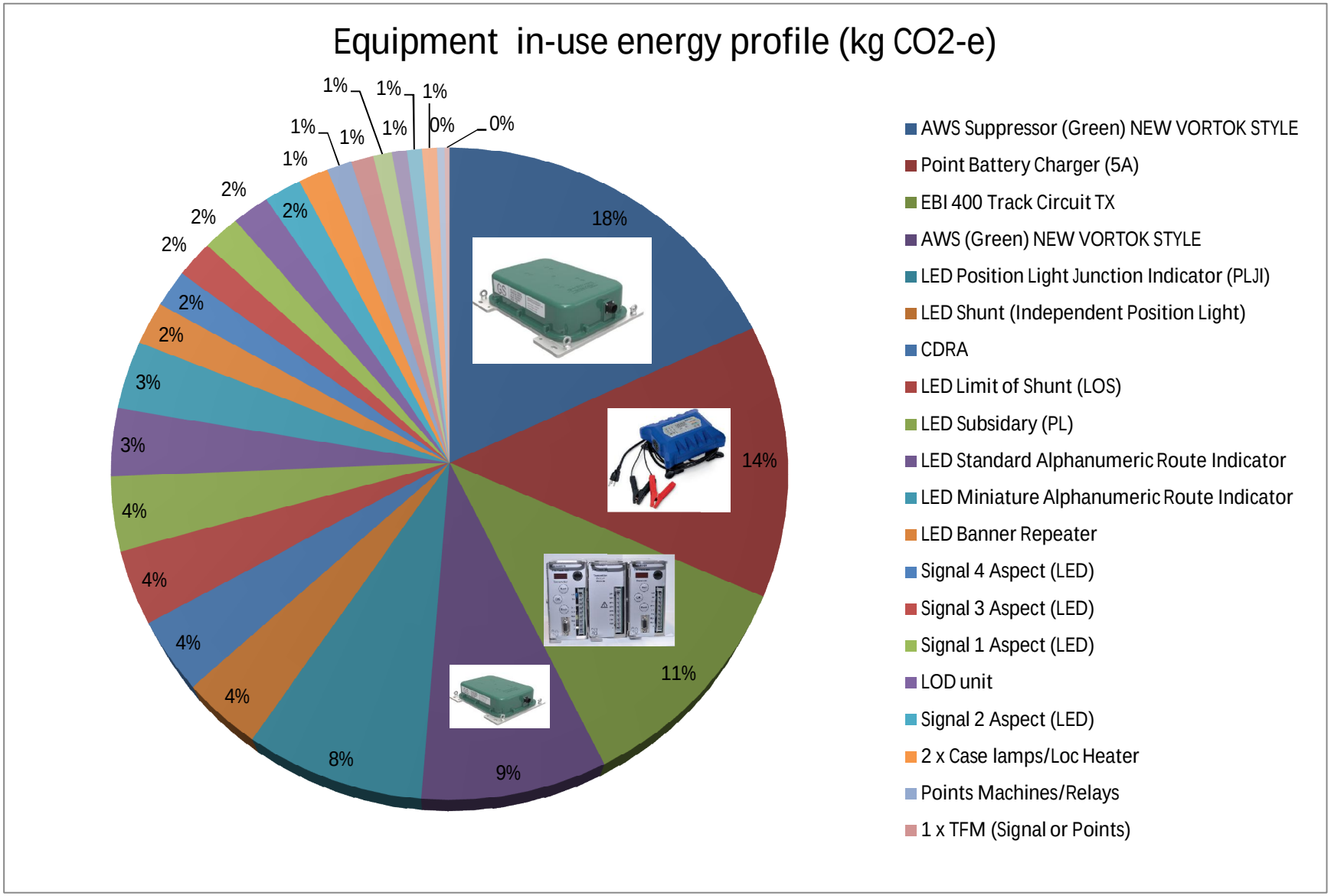

Figure 3. In-use Energy Profiling - Thameslink in-use emission profile (taking into consideration number of units ordered)