



**London Borough of Sutton**

**CLCSS Pilot**

**Launch: 21 September 2011**



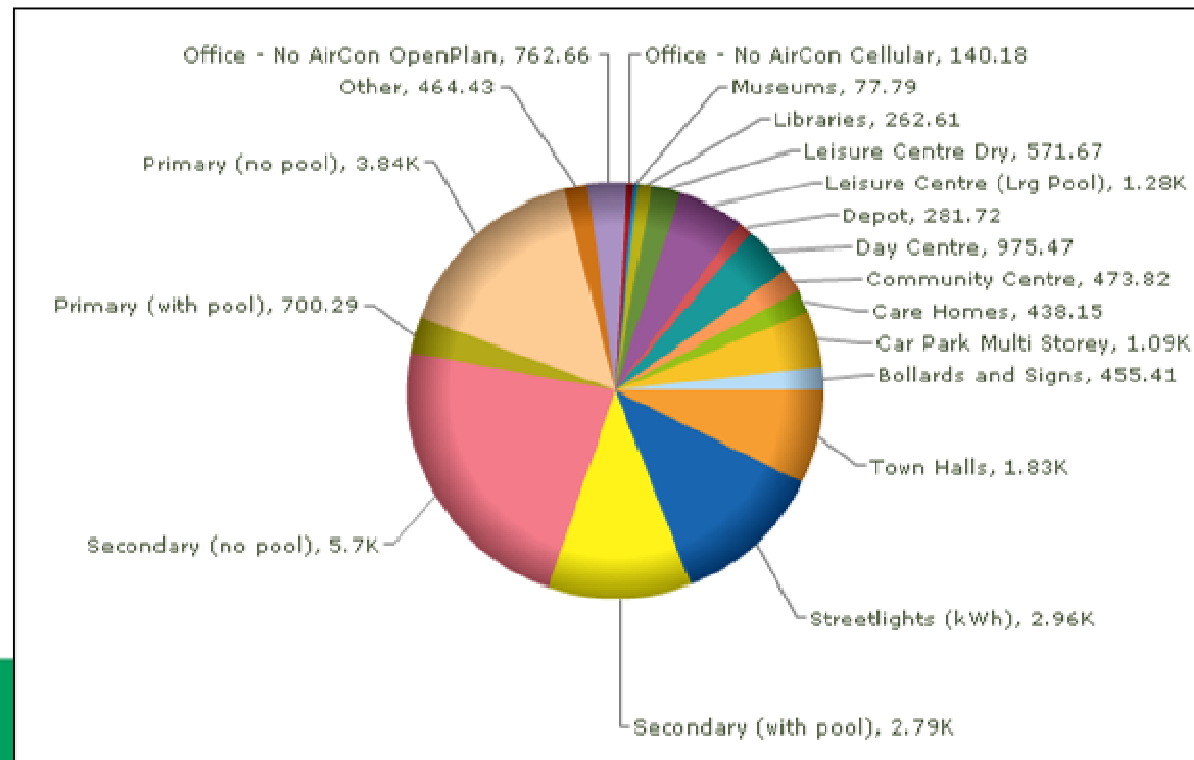
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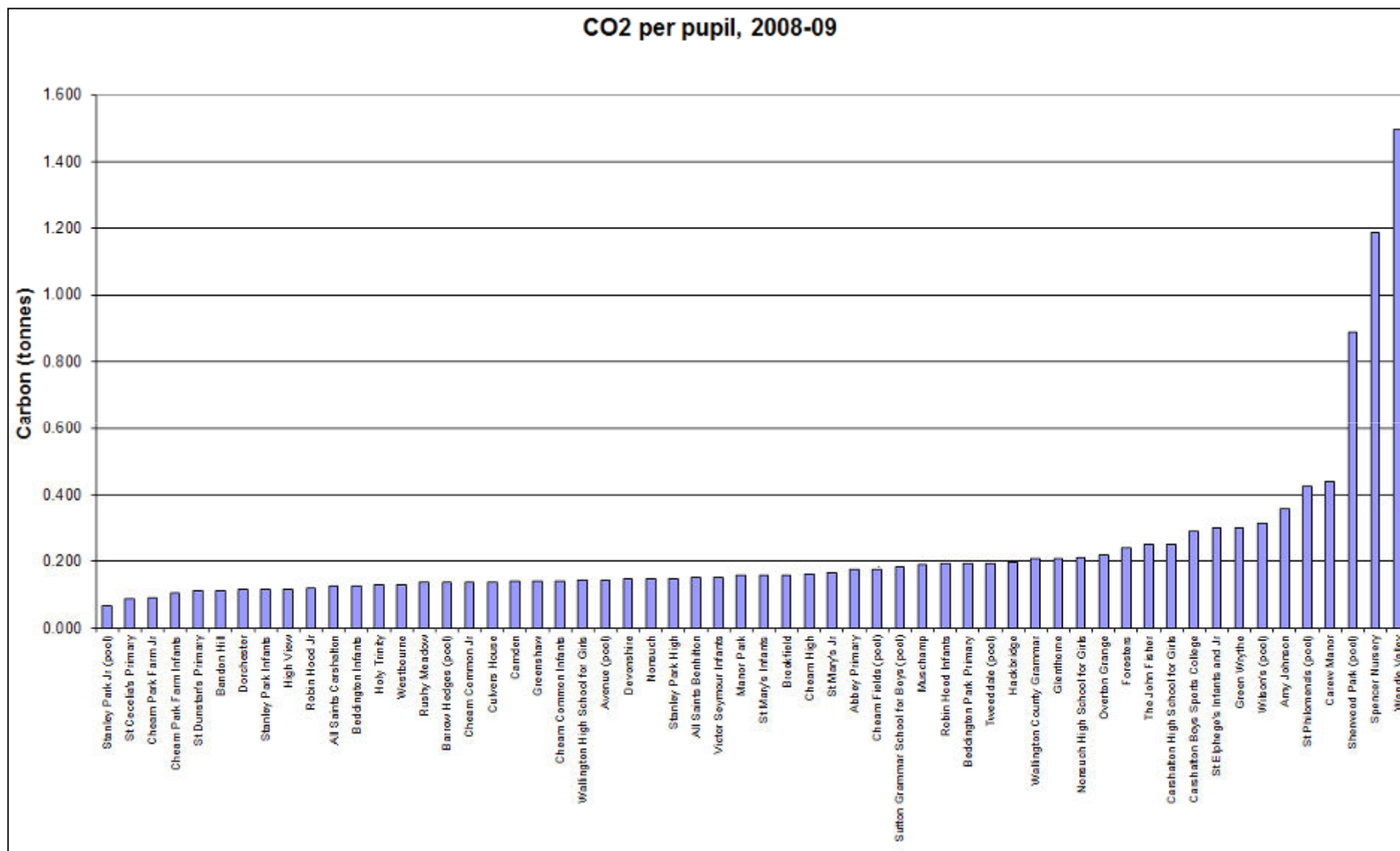
# London Borough of Sutton

- The LA produces approximately 23,000 tonnes of CO2 per annum (10-11)
- 55.5% of this comes from schools
- The CRC payment for schools will be £141,000 (£12 per tonne)

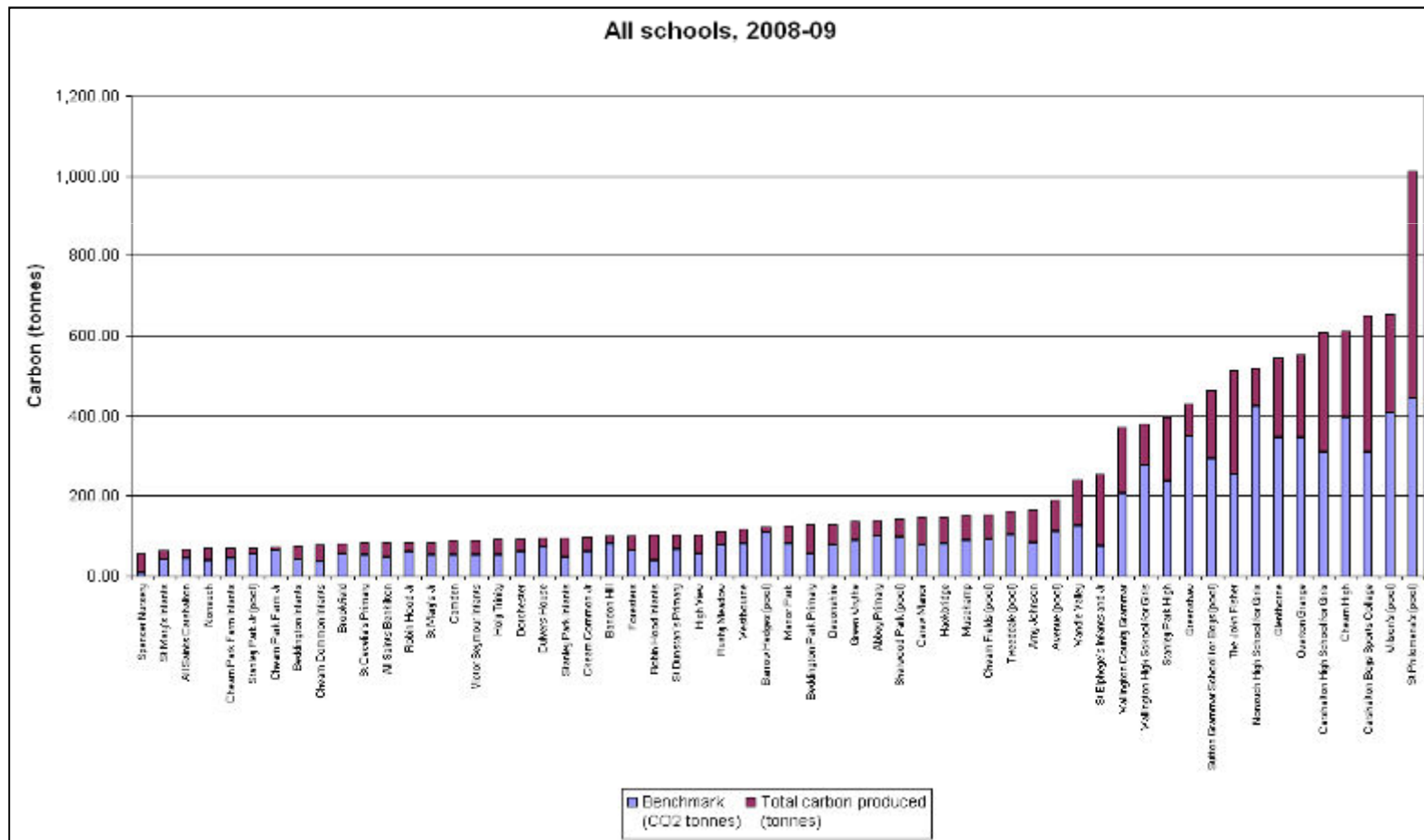
## **LBS carbon emissions (08-09):**



# CO2 per pupil



- Graph shows how each school performs against it's benchmark
- On average, primary schools produce 80% more CO2 than their benchmarks and secondary schools produce 70% more
- If all schools reached their benchmarks, we could save approximately  
5,000 tonnes of CO2      = £60,000 CRC costs (x £12 per tonne)  
   = £750,000 on electricity bills (x £150 per tonne)



## CLCSS in Sutton

### Objective:

To assist schools with reducing their energy consumption through **zero-cost** measures.

### *Why zero cost?*

- Short time period: 10 weeks
- Focus on good behaviour: don't waste energy
- Significant savings to be made:

	CARBON THAT COULD BE SAVED (TONNES), CLCSS PILOT SCHOOLS										
	A	B	C	Suggested energy efficiency measures (years payback)					Total Potential Savings (carbon tonnes)	% of 'C' (total carbon to save to reach benchmark)	0-5 yr payback as a % of 'C' (total carbon to save to reach benchmark)
	2008-09 carbon produced (tonnes)	Benchmark (carbon tonnes)	Total carbon to save to reach benchmark (tonnes)	0	1-5	6-10	11-25	26+			
Cheam Common Infants	79.28	36.07	43.21	4	6	5	9	14	38	87.94%	23.14%
Cheam Fields (pool)	153.27	93.42	59.85	6	12	16	9	5	48	80.20%	30.08%
Dorchester	92.42	62.42	30.00	1	4	2	4	3	14	46.40%	14.93%
Muschamp	150.82	90.17	60.65	23	33	0	3	4	63	103.87%	92.33%
Robin Hood Jr	84.41	60.45	23.96	8	13	8	12	13	54	225.38%	87.65%
Stanley Park Jr (pool)	71.11	54.62	16.49	15	17	15	7	14	68	412.37%	194.06%
Tweeddale (pool)	163.21	103.21	60.00	14	28	6	10	11	69	115.00%	70.00%
Victor Seymour Infants	89.27	51.73	37.54	17	34	5	12	30	98	261.05%	135.86%
Overton Grange	552.62	346.09	206.53	130	79	108	2	0	319	154.46%	101.20%
Sutton Grammar School for Boys (pool)	461.98	291.76	170.22	54	126	21	0	28	229	134.53%	105.75%
			<b>Total</b>	<b>272</b>	<b>352</b>	<b>106</b>	<b>68</b>	<b>122</b>	<b>1,000</b>	<b>&lt; 50%</b>	<b>Bold: 75-100% towards benchmark</b>
										<b>51-100%</b>	
										<b>100% +</b>	

- Of the ten pilot schools, 272 tonnes could be saved at no cost (£3,264 CRC and £40,800 electricity)

10-week period, to include:

- [illegible]

## **Trainings offered:**

- 1: Zero-cost savings:      demonstration of practical activities  
   understanding energy audit
- 2: Heating controls (NB: please complete form in hand-out)

## **Outputs:**

- Case study and report
- Recommendations

## **Activities:**

- Practical activities provided for your Eco Team to carry out each week, with help from others
- Focus on lighting, IT equipment and heating

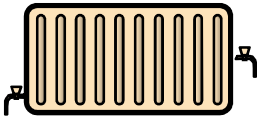


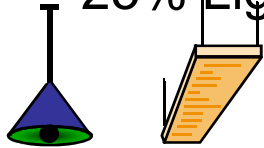

# **Energy Efficiency Opportunities in Schools**

**Ed Horgan, Carbon Trust**





# Fuel Use in a Typical School

Fuel used (kWh)	Typical fuel prices	Fuel costs	Fuel uses
75% Gas, Oil	Ratio 1	50% Gas, Oil	38% Heating 
			7% Hot Water 
			8% Catering 
			25% Lighting 
25% Electricity	Ratio 3	50% Electricity	22% other Electrical 

# 1. Active Labelling of Lighting

- Lighting controlled by multiple switches
- Not all lighting normally needs to be on
- Identify unnecessary rows
- Agree with class teacher
- Mark up switches

**It is a myth that it is cheaper to leave fluorescent lights on**



# Reduce Light Levels



Before



After

## 2. Lighting Switch Off

- Nominate lighting monitor
- Assess amount of natural daylight regularly
- Switch off lights accordingly
- Ensure appropriate use of blinds
- Keep windows free from obstruction
- Switch off lights when room vacated



# Lights off - Unoccupied



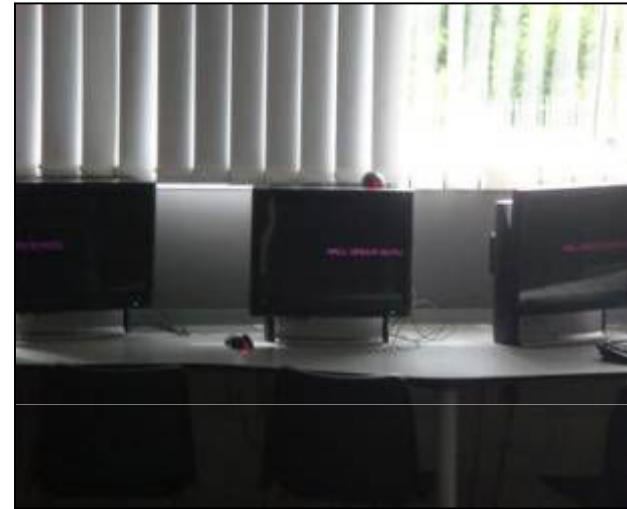
# Switch off – Day light



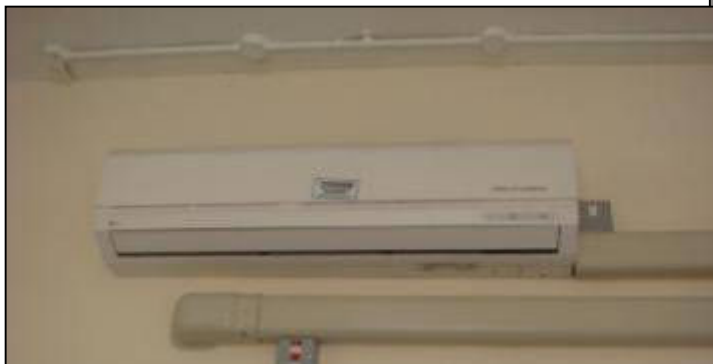


### 3. IT Switch Off

- Identify all IT equipment
- Is it left on unnecessarily?
- Traffic Light Coding System
  - **Green**: anyone can switch off
  - **Amber**: check with user before switching off
  - **Red**: don't touch
- Communicate – whole school to switch off



# Switch off?



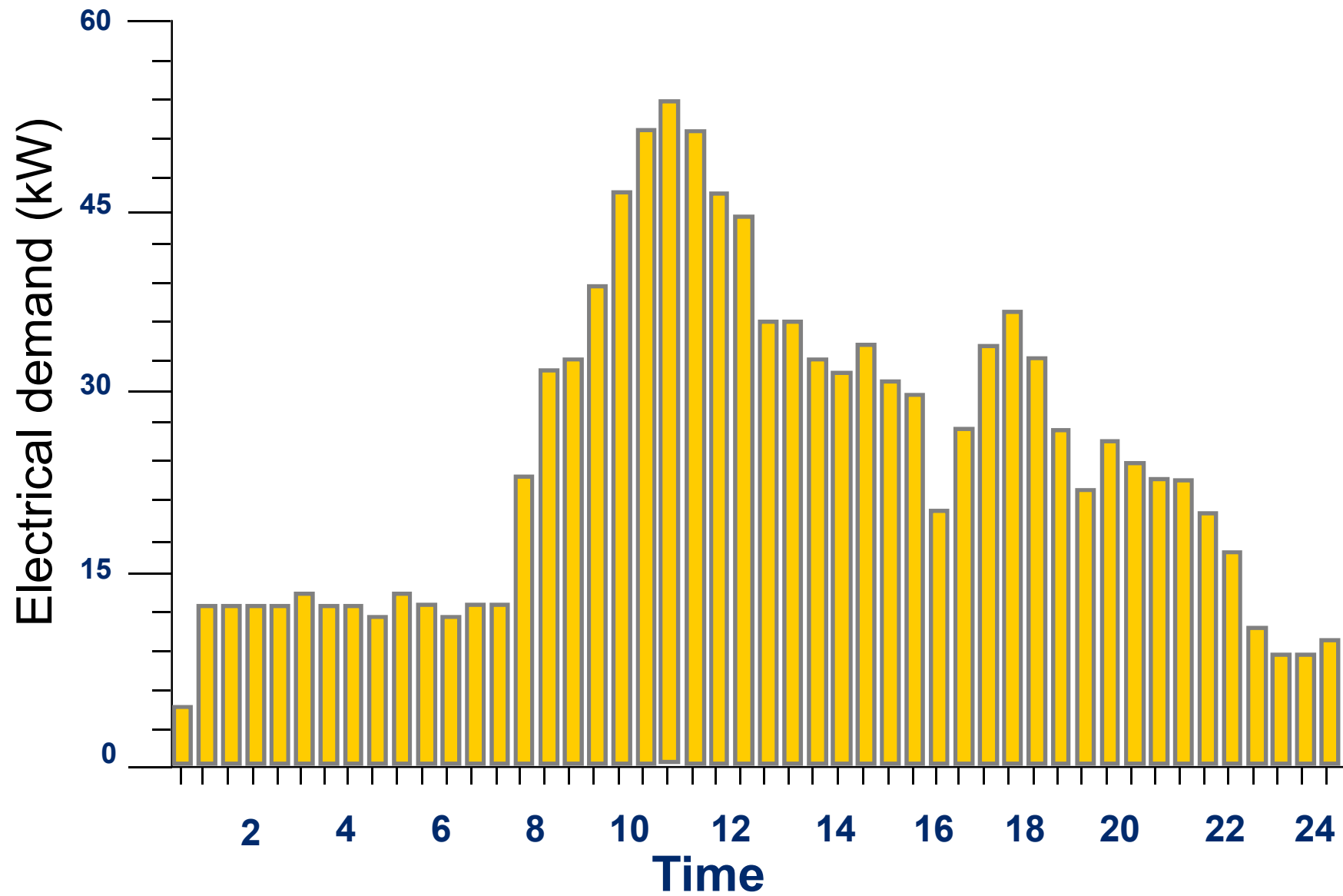


## 4. Reducing your out-of-hours electrical load

- Check overnight load in kW
- Undertake survey – identify electrical items left on unnecessarily and use Traffic Light Coding System
- Switch off **green** and **amber**
- Calculate reduced kW load – subtract from original
- Maintain best practice level



# Daily Electrical Load Profile



# **Carbon Reduction Toolkit 2:**

## **Taking Control Of Your Heating**



# Heating

- Overheating by 1°C can increase consumption by 10%
- Overheating of 3 to 4°C is not unknown
  - 18° C recommended for classrooms
  - 15° C recommended for gyms & corridors
- Don't place obstructions in front of heaters
- Check fan convector filters are cleaned



Radiator boxed in

Electrical fan heater as last resort!



# Close doors



# Insulation



# Thermostats/Sensors

- Thermostats should not be near heat sources or draughts
- Locate internal optimum start sensors in coldest part of building/heating zone
- External sensors – north facing wall
- Don't use thermostat as on/off switches





## What next: WEEK 1

- Set up your Action Team:
  - Governor(s)
  - Head or Deputy
  - Bursar and/or Business Manager
  - Premises Manager/ Caretaker
  - Eco-Schools Coordinator
  - Pupils

To think about:      Who is the project leader?  
Who needs to meet weekly?  
Who is responsible for taking meeting readings?



- Arrange meeting with Project Leader to meet with the Action Team: to discuss the project timetable and finalise roles and responsibilities.
- Sign MOU and collect Certificate of Participation

## WEEK 2

- Attend Training 1: recommended site manager and Eco-Schools Coordinator
- Eco-Team Energy audit – how many computers and lights are left on at lunchtime?
- Take meter reading

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## WEEK 3

- Eco-Team 'Active Labelling of Light Switches'
- Take meter reading

## WEEK 4

- Eco-Team 'Switch off Lighting'
- Take meter reading
- Action Team report

## WEEK 5: Half Term

- Take meter reading if possible

## WEEK 6

- Training 2: Control of your heating. Site manager recommended
- Eco-Team 'IT equipment switch off'
- Take meter reading
- Meeting with Project Leader:

Energy audit

Work towards next Eco-Schools award

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The Seven Elements	Blue Ribbon Award 2011	
	Element	Criteria
Active team	The school has established an active team responsible for all Eco-Schools activities.	The school has established an active team responsible for all Eco-Schools activities.
Environmental policies	The school has developed a formal policy for the environment.	The school has developed a formal policy for the environment.
Action plan	The school has developed a formal plan for the environment.	The school has developed a formal plan for the environment.
Waste Cycle	The school has a formal policy for the environment.	The school has a formal policy for the environment.
Water Cycle	The school has a formal policy for the environment.	The school has a formal policy for the environment.
Energy Cycle	The school has a formal policy for the environment.	The school has a formal policy for the environment.
IT equipment	The school has a formal policy for the environment.	The school has a formal policy for the environment.
Linking to the curriculum	The school has a formal policy for the environment.	The school has a formal policy for the environment.
Monitor & Evaluate	The school has a formal policy for the environment.	The school has a formal policy for the environment.





## **WEEK 7**

- 'Reducing your out of hours load'
- Take meter reading

## **WEEK 8**

- Heating controls (TBC)
- Take meter reading

## **WEEK 9**

- Eco-Team school assembly
- Take meter reading
- Action Team report

## **WEEK 10**

- Meeting with Project Leader: next steps and recommendations
- Submit 'Cut Carbon, Cut Costs' competition



## Meter readings

- We are asking schools to read their meters weekly, preferably on Monday mornings
- Meter reading spread sheet available, to be returned to John Sinclair
- To enable us to monitor energy consumption and identify when the measures have been implemented and level of saving achieved
- Only long-term monthly energy monitoring and continued diligence in ensuring lights and PCs etc are turned off, can the CO2 reductions be accurately identified.

Carbon Trust Collaborative Low Carbon Schools Service						
Weekly Meter Reading Record for: Cheam Common Infants'						
Date: (Monday)	Electricity Meter Serial Number(s)		Gas Meter Serial Number(s)			
	7 261736		A2284201A	608642S		
28-Sep-2011						
03-Oct-2011						
10-Oct-2011						
17-Oct-2011						
24-Oct-2011						
31-Oct-2011						
07-Nov-2011						
14-Nov-2011						
21-Nov-2011						
28-Nov-2011						
05-Dec-2011						
12-Dec-2011						
19-Dec-2011						
26-Dec-2011						

# Heating Controls

## Carbon Trust Collaborative Low Carbon Schools Service

General Heating and Electricity Information Form for

School

### HEATING SYSTEMS

How many heating systems are there in the school?

For each heating system:

1	No. of Boilers	Boiler Manufacturer	Rating of Boilers in kW	Control Manufacturer	Type of Controls see Note 1
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2	No. of Boilers	Boiler Manufacturer	Rating of Boilers in kW	Control Manufacturer	Type of Controls see Note 1
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3	No. of Boilers	Boiler Manufacturer	Rating of Boilers in kW	Control Manufacturer	Type of Controls see Note 1
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4	No. of Boilers	Boiler Manufacturer	Rating of Boilers in kW	Control Manufacturer	Type of Controls see Note 1
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Note 1: e.g. BEM II, Optimum Start, Weather Compensation or other if known, not known

### ELECTRICAL SYSTEMS

Is there an IT Server Room?

YES / NO

Please delete which ever inapplicable

If yes, does this have Air Conditioning?

YES / NO

Please delete which ever inapplicable

What type of lighting fittings are installed in the school? Please indicate which types

Fluorescent T12 tubes (old type switch start, 38mm diameter tubes)

YES / NO

Fluorescent T8 tubes (old type switch start, 26mm diameter tubes)

YES / NO

Fluorescent T8 tubes (new HF type, 26mm diameter tubes)

YES / NO

Fluorescent T6 tubes (new HF type, 16mm diameter tubes)

YES / NO

Tungsten bulbs (OIL or PAR)

YES / NO

Tungsten Halogen bulbs (dichroic or linear)

YES / NO

Compact Fluorescent Lamps

YES / NO

LED

YES / NO

Don't know / can't tell

Does the school have any special electrical equipment installed?

Please list here:

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# Energy Management Matrix

Energy management matrix						
	Policy	Organising	Training	Performance measurement	Communicating	Investment
4	Energy policy action plan and regular review have active commitment of top management <input type="checkbox"/>	Fully integrated into management structure with clear accountability for energy consumption <input type="checkbox"/>	Appropriate and comprehensive staff training tailored to identified needs, with evaluation <input type="checkbox"/>	Comprehensive performance measurement against targets with effective management reporting <input type="checkbox"/>	Extensive communication of energy issues within and outside the school <input type="checkbox"/>	Resources routinely committed to energy efficiency <input type="checkbox"/>
3	Formal policy but no active commitment from top <input type="checkbox"/>	Clear line management accountability for consumption and responsibility for improvement <input type="checkbox"/>	Energy training targeted at major users following training needs analysis <input type="checkbox"/>	Weekly performance measurement for each building or site <input type="checkbox"/>	Regular staff briefings, performance reporting and energy promotion <input type="checkbox"/>	Same appraisal criteria used as for other cost reduction projects <input type="checkbox"/>
2	Unadopted policy <input type="checkbox"/>	Some delegation of responsibility but line management and authority unclear <input type="checkbox"/>	Ad hoc internal training for selected people as required <input type="checkbox"/>	Monthly monitoring by fuel type <input type="checkbox"/>	Some use of school communication mechanisms to promote energy efficiency <input type="checkbox"/>	Low or medium-cost measures considered if short payback period <input type="checkbox"/>
1	Unwritten set of guidelines <input type="checkbox"/>	Informal, mainly focused on energy supply <input type="checkbox"/>	Technical staff occasionally attend specialist courses <input type="checkbox"/>	Invoice checking only <input type="checkbox"/>	Ad hoc informal contacts used to promote energy efficiency <input type="checkbox"/>	Only low or no-cost measures taken <input type="checkbox"/>
0	No explicit energy policy <input type="checkbox"/>	No delegation of responsibility for managing energy <input type="checkbox"/>	No energy-related staff training provided <input type="checkbox"/>	No measurement of energy costs or consumption <input type="checkbox"/>	No communication or promotion of energy issues <input type="checkbox"/>	No investment in improving energy efficiency <input type="checkbox"/>

# Energy Action Plan

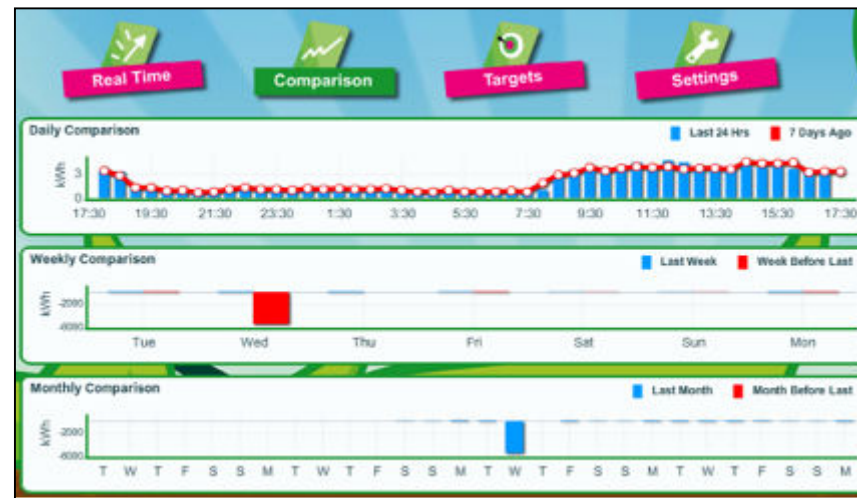
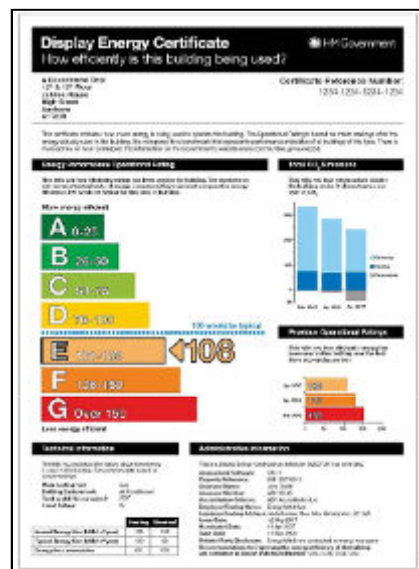
Priority	Opportunity	Estimated annual savings		Person Responsible	Expected Date of Completion	Actual Date of Completion	Education Opportunity (Pupil Involvement)
		(£)	CO <sub>2</sub> (tonnes)				
1							
2							
3							
4							
5							
6							
7							
TOTALS							

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## Existing tools and resources

- Energy Display Meter: easy way to monitor energy consumption
- Display Energy Certificate (DEC):  
Use this to set an achievable target



- OWL (distributed as part of Project Genie)
- Energy audit – useful explanations of the recommendations