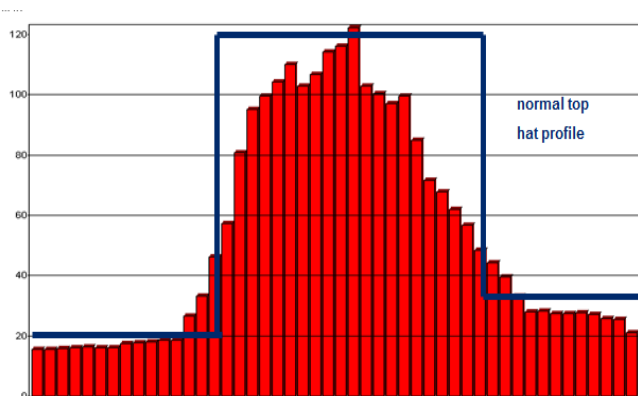


# How have schools achieved energy reduction?



**AMR**

**Energy audit**



**Implementing energy projects**

**Energy & Children**

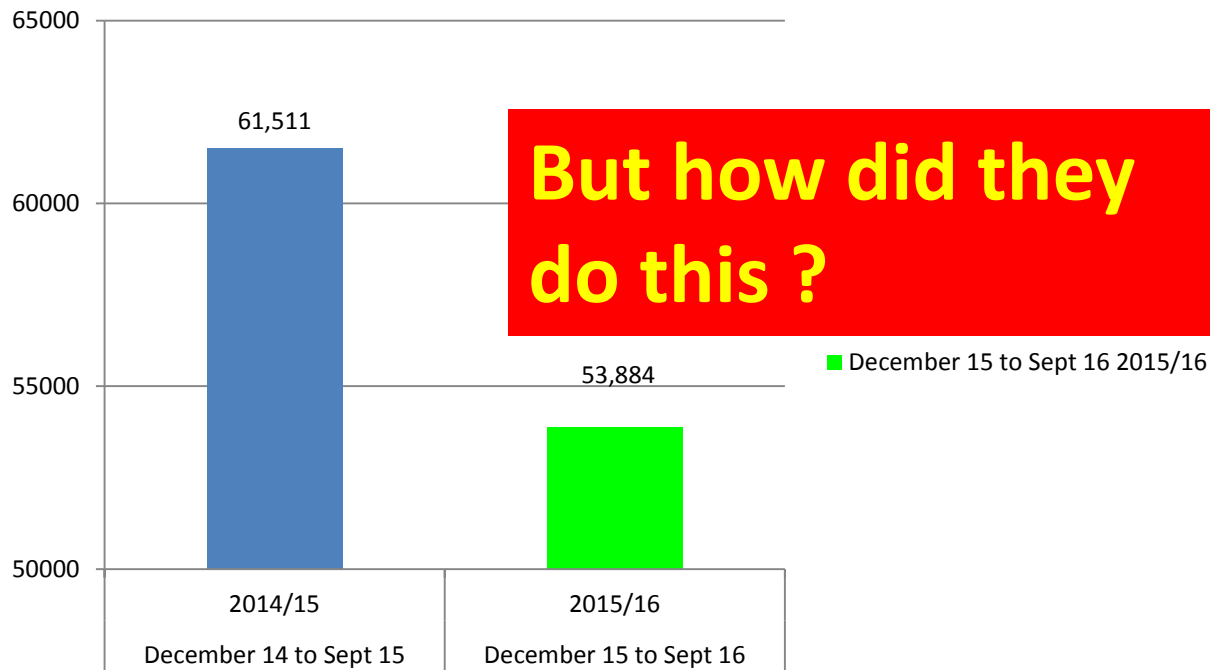


**How did we do ?**

# Energy - Results

## ➤ Haslucks Green School – Year 1 (Electric)

Haslucks Green School (electric)



**12%  
down**

**£1606  
saving**

Over a 10 month period only

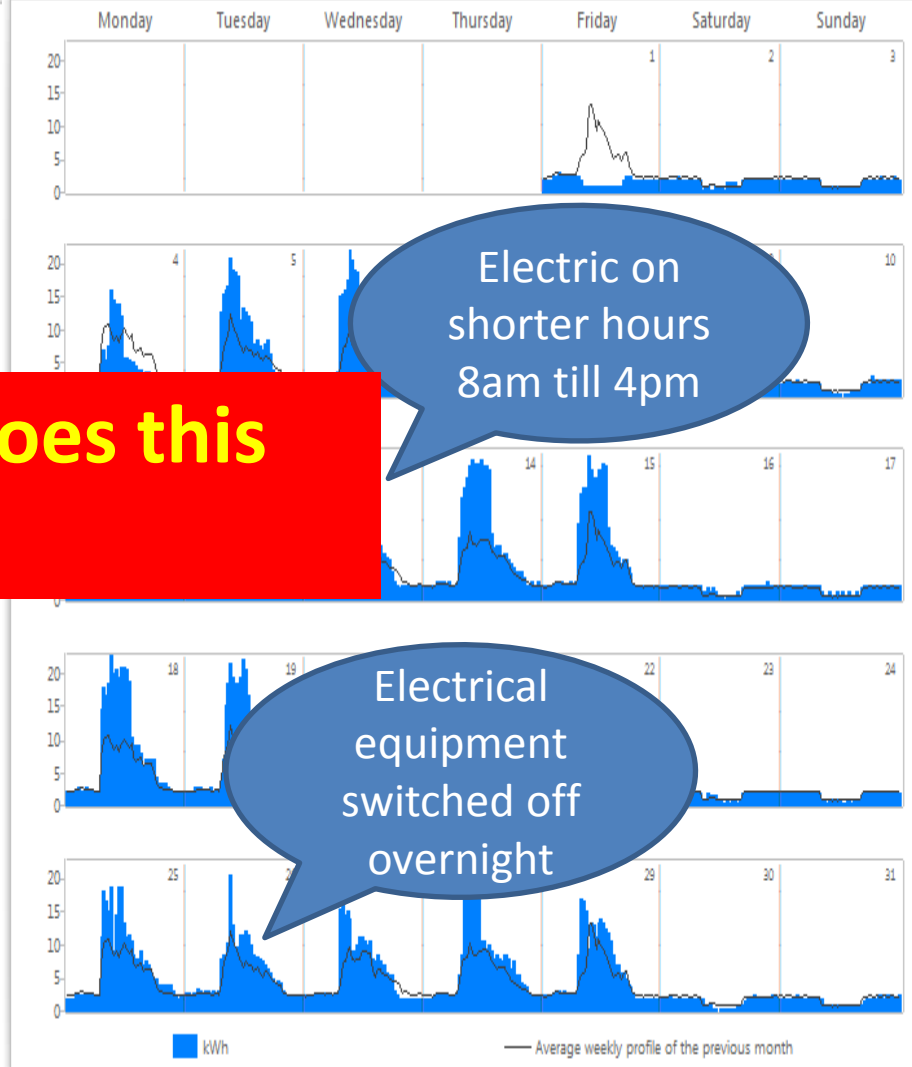
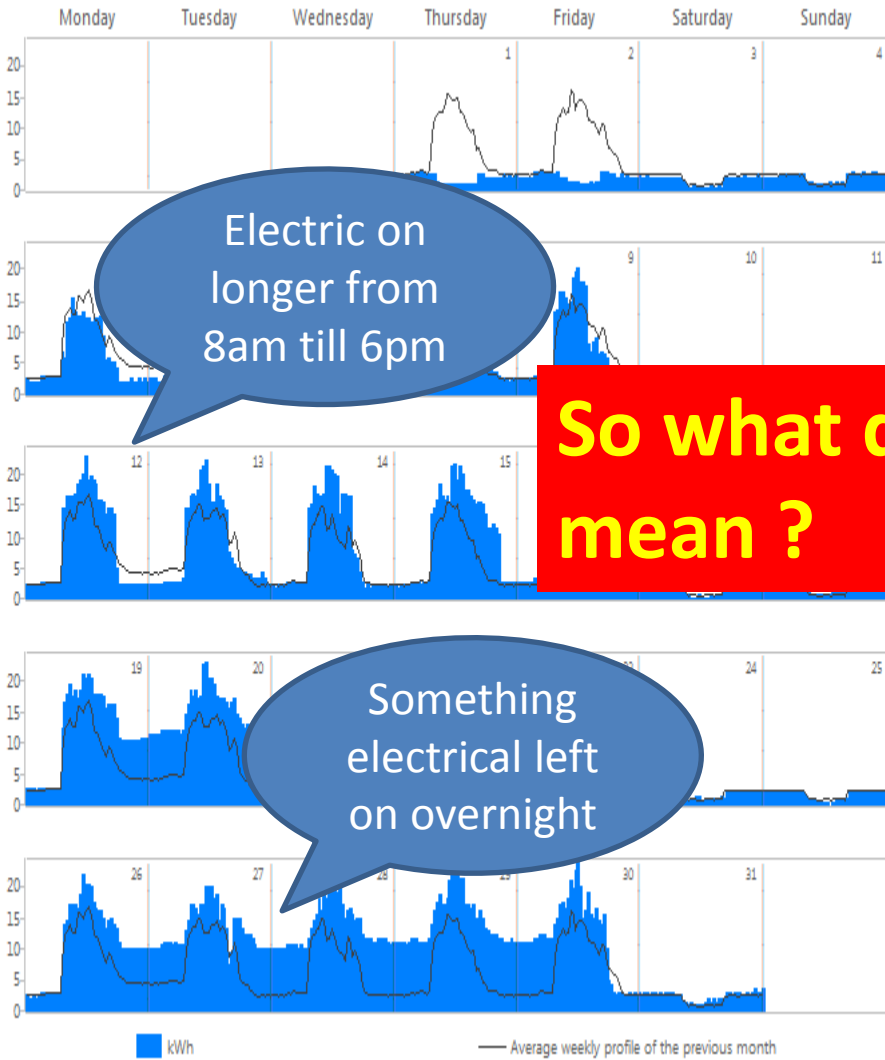
# Hasluck's Green – How? Monthly AMR Profile

## Jan 2015

**Before**

## Jan 2016

**After**



**So what does this mean ?**

Something electrical left on overnight

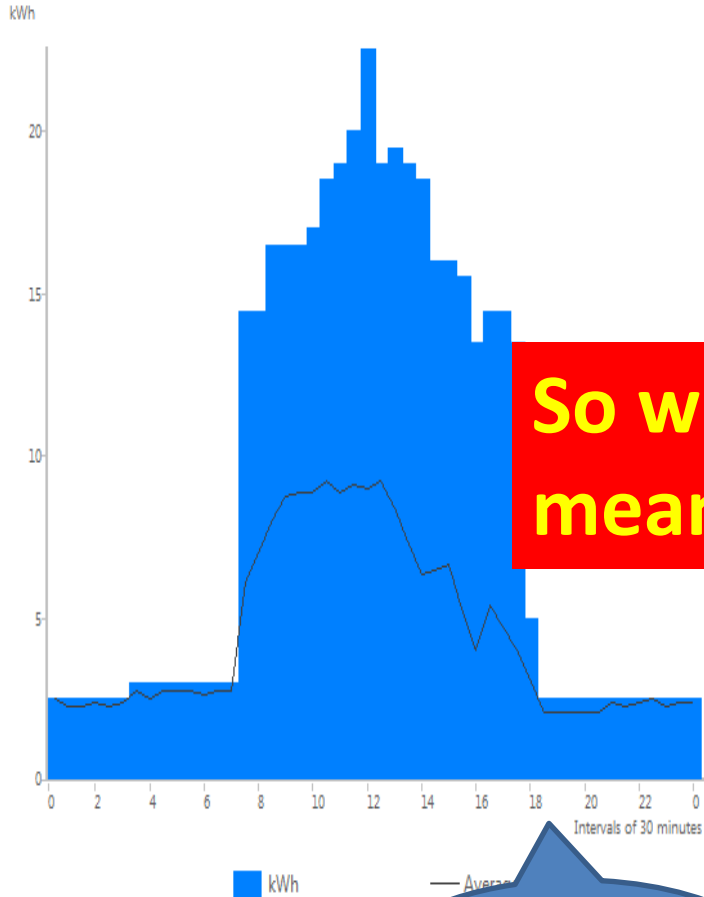
Electrical equipment switched off overnight

# Hasluck's Green – How? Daily AMR Profile

12<sup>th</sup> Jan 2015

**Before**

Day Profile of Electricity Consumption

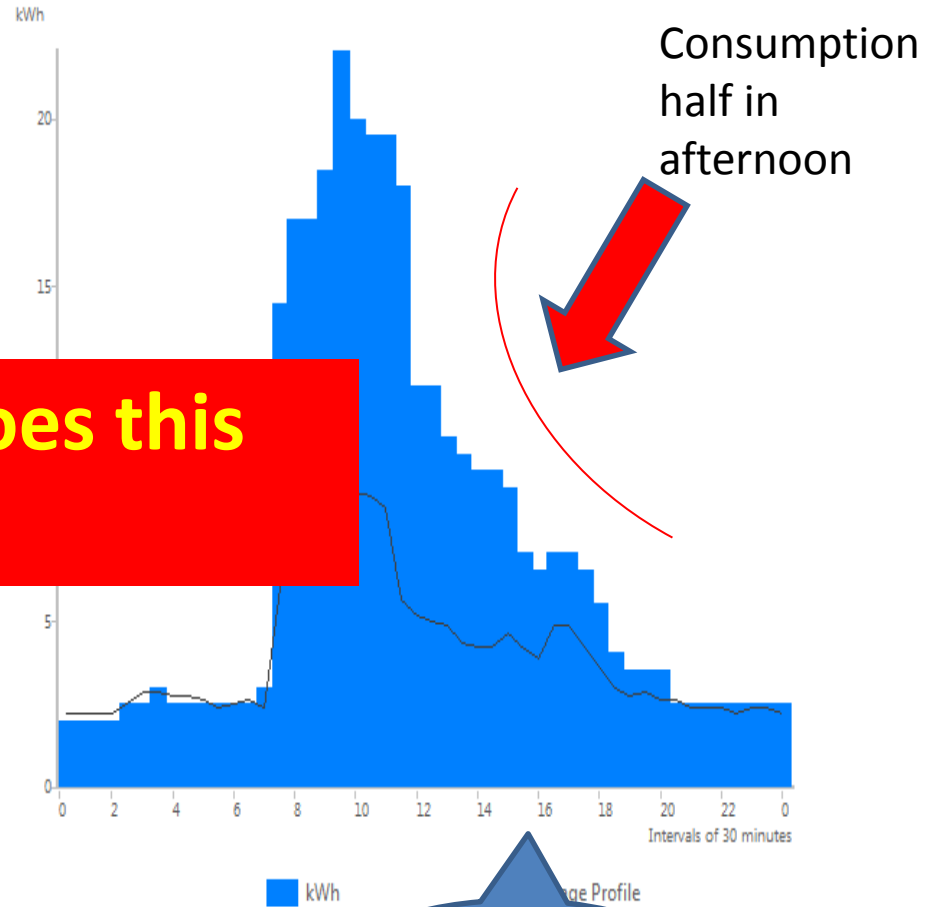


Electric on longer from 8am till 6pm

12<sup>th</sup> Jan 2016

**After**

Day Profile of Electricity Consumption



Electric on shorter hours 8am till 4pm

**So what does this mean ?**

# Hasluck's Green – How? Cost AMR Profile

12<sup>th</sup> Jan 2015

**Before**

12<sup>th</sup> Jan 2016

**After**



Cost Profile - Day by Interval - Electricity

**Stark**

Company: Solihull MBC - Primary Schools  
 Site: Haslucks Green School - NH-H Pre-CoMC P272  
 Full MPAN / Meter ID: S06 034 022 1419559041002 / 39184901  
 Online Meter Name: NH-H 1419559041002 - 39184901 - retired P272 CoMC 15/01/2017



Report For: Monday 12/01/15  
 Report Run Date: 11/09/18 @ 10:31:52

This report will not match your bill exactly

Supply	Consumption	Cost
Day (07:00-00:00)	390 kWh	£44.18
Night (00:00-07:00)	39 kWh	£2.69

Estimated Supply 429 kWh £46.88

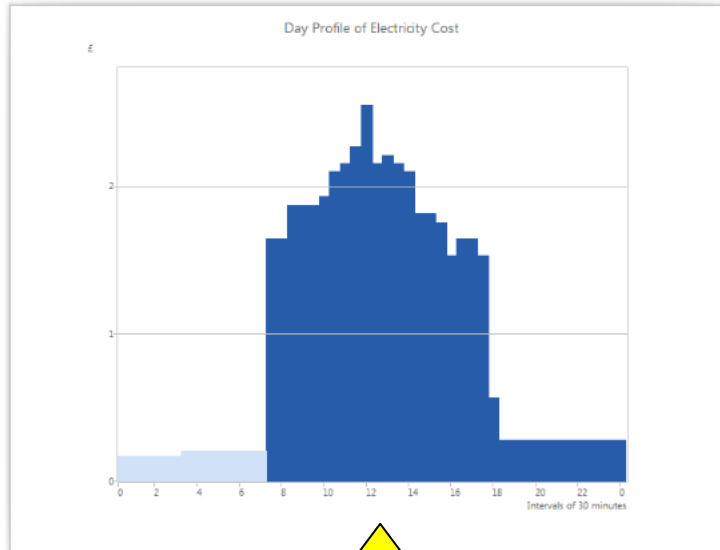
DUoS Not Charged

**£47**

Estimated DUoS Not Charged

Availability Charges @ 1000kVA	£0.00
Standing Charge	£0.00
Settlements Charge	£0.00
Miscellaneous Charge	£0.00
CCL Cost	£0.00
Net Cost	£46.88
VAT Cost (at 20.0%)	£9.38
<b>Estimated Total Cost</b>	<b>£56.25</b>

Report Time Zone: (UTC+00:00) Dublin, Edinburgh, Lisbon, London (With Daylight Saving)



**New Cost Profile  
Report shows for  
1 day**

Cost Profile - Day by Interval - Electricity

**Stark**

Company: Solihull MBC - Primary Schools  
 Site: Haslucks Green School - NH-H Pre-CoMC P272  
 Full MPAN / Meter ID: S06 034 022 1419559041002 / 39184901  
 Online Meter Name: NH-H 1419559041002 - 39184901 - retired P272 CoMC 15/01/2017



Report For: Tuesday 12/01/16  
 Report Run Date: 11/09/18 @ 10:31:29

This report will not match your bill exactly

Supply	Consumption	Cost
Day (07:00-00:00)	313 kWh	£33.50
Night (00:00-07:00)	34 kWh	£2.12

Estimated Supply 347 kWh £35.62

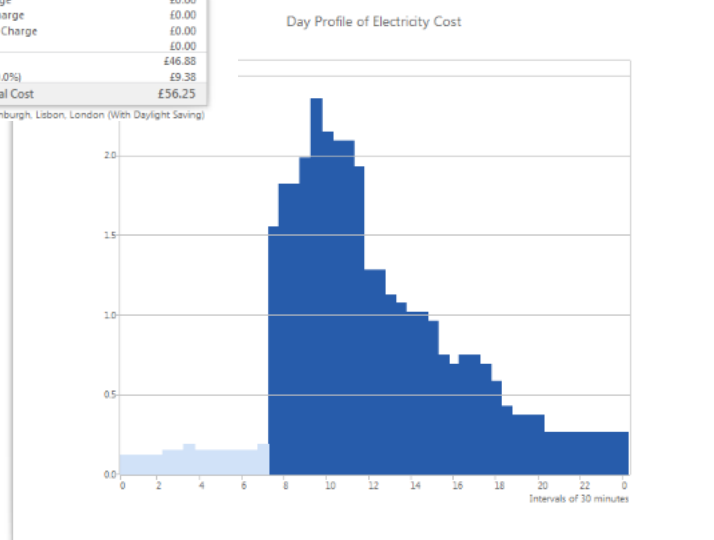
DUoS Not Charged

**£35**

Estimated DUoS Not Charged

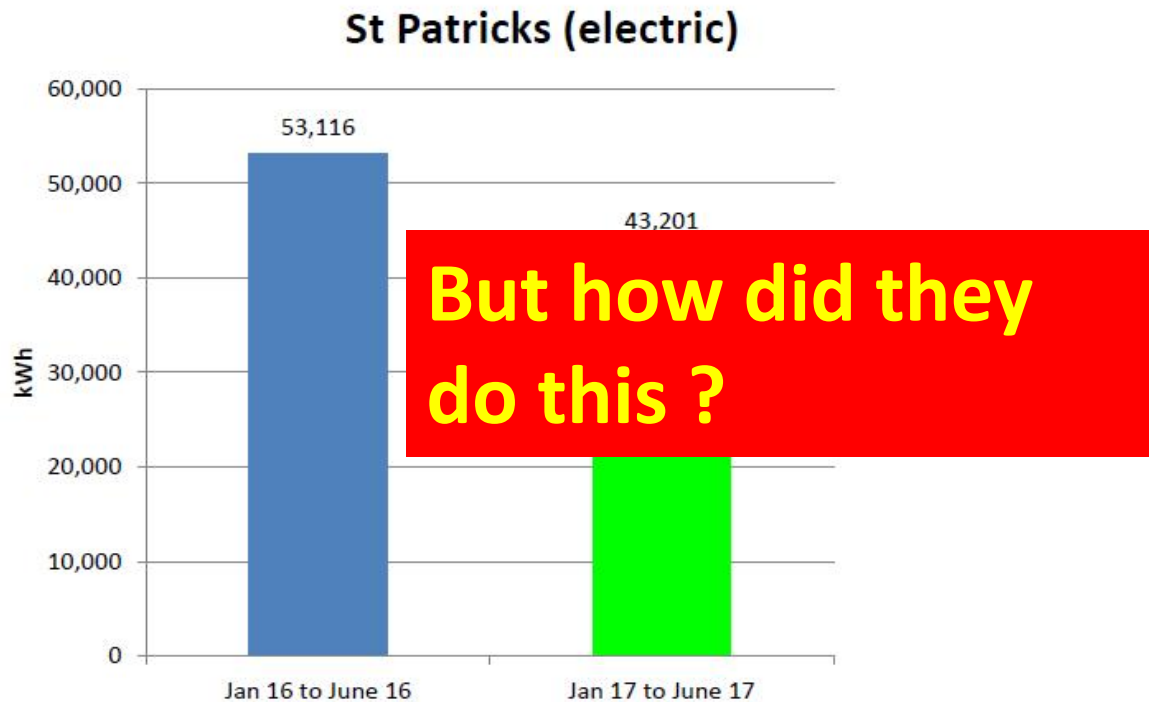
Availability Charges @ 1000kVA	£0.00
Standing Charge	£0.00
Settlements Charge	£0.00
Miscellaneous Charge	£0.00
CCL Cost	£1.92
Net Cost	£37.54
VAT Cost (at 20.0%)	£7.51
<b>Estimated Total Cost</b>	<b>£45.05</b>

Report Time Zone: (UTC+00:00) Dublin, Edinburgh, Lisbon, London (With Daylight Saving)



# Energy - Results

## ➤ St Patricks – Year 2 (Electric)



**19%  
down**

**£811  
down**

Over a 6 month period only

Feb 2016

**Before**

Consumption bulky at end of day

Consumption hits 20kWh

Baseload 5kWh

**So what does this mean ?**

No consumption blip at end of day

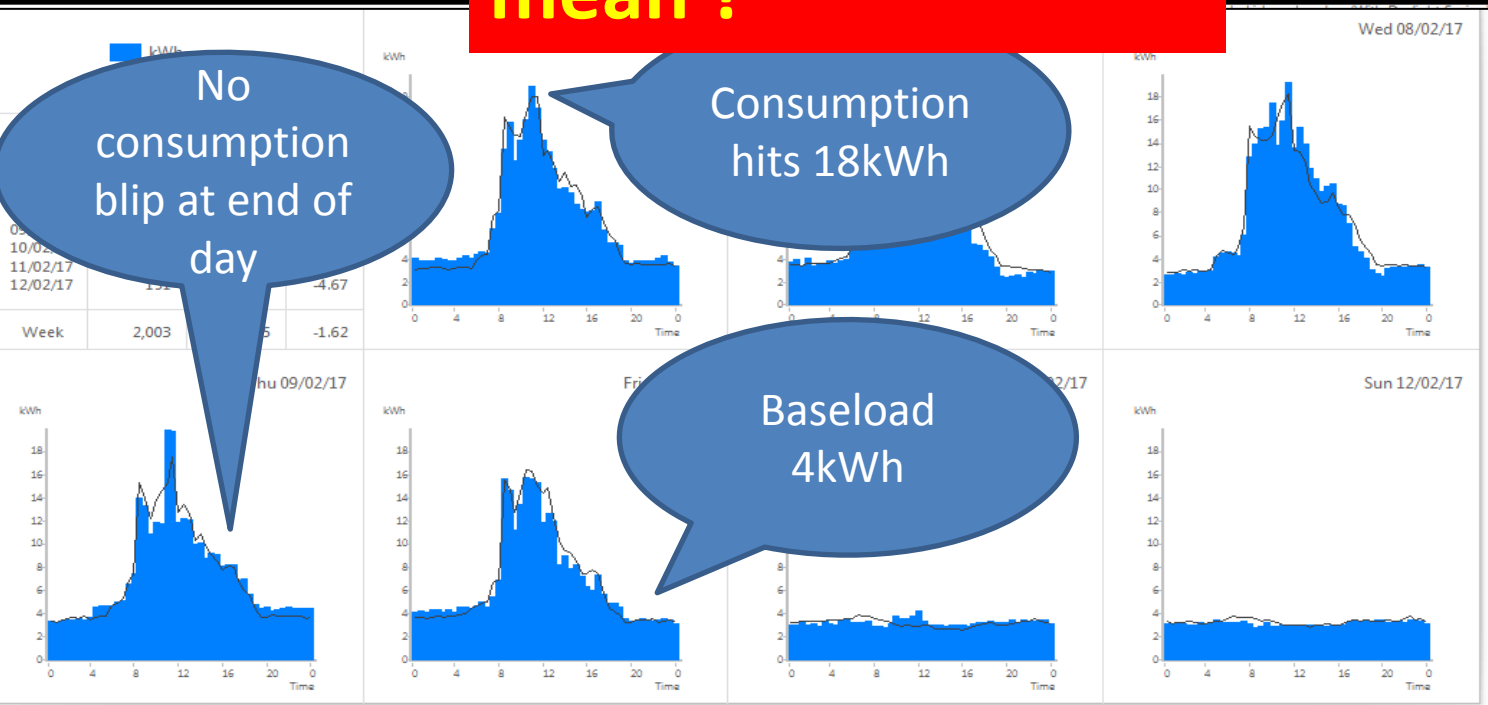
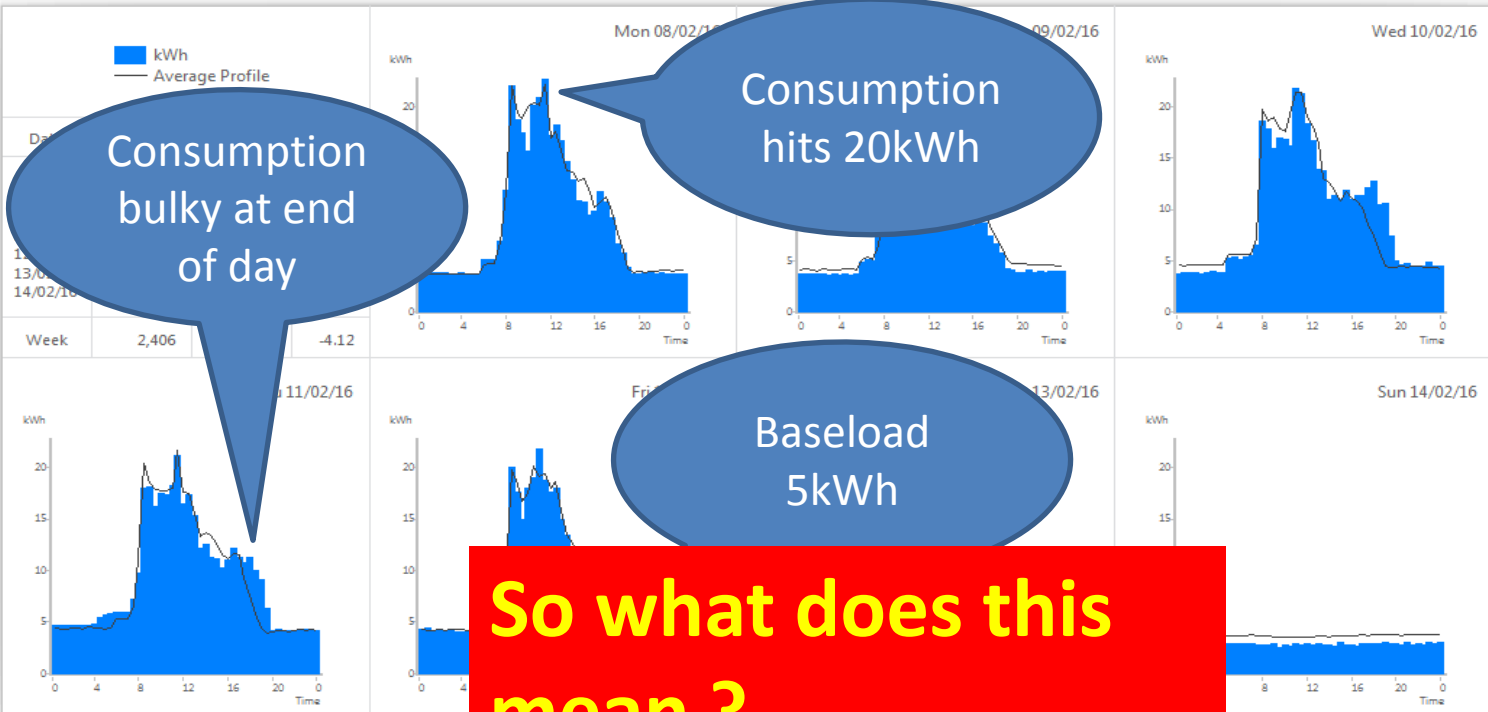
Consumption hits 18kWh

Baseload 4kWh

Feb 2017

**After**

**St Patricks – How?  
Weekly AMR Profile**



Company: Solihull MBC - Primary Schools  
 Site: St Patrick's C of E Primary School Academy  
 Full MPAN / Meter ID: S03 1414000041001 / 38470394  
 Online Meter Name: NHH 1414000041001 - 38470394



Report For: Mon 08/02/16 - Sun 14/02/16  
 Report Run Date: 11/09/18 @ 11:46:31  
 This report will not match your bill exactly

# New Cost Profile Report Weekly

Feb 2016

**Before**

**£305**

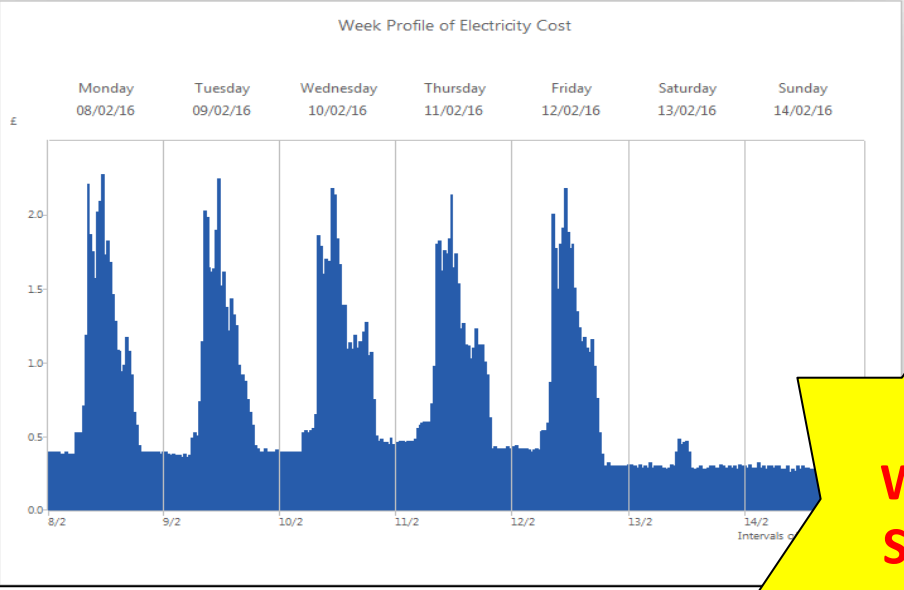
Supply	Consumption	Cost
Single Rate	2,406 kWh	£241.50

Supply (Estimated) 2,406 kWh £241.50

DUoS Not Charged

Not Charged

@ 1000kVA	£0.00
	£0.00
	£0.00
	£0.00
	£13.33
	£254.83
	£50.97
	£305.79



**WEEKLY SAVING £51**

Cost Profile - Week by Interval - Electric  
 Solihull METROPOLITAN BOROUGH COUNCIL

Stark

Feb 2017

**After**

**£254**

Report For: Mon 06/02/17 - Sun 12/02/17  
 Report Run Date: 11/09/18 @ 11:46:13  
 This report will match your bill exactly

Supply	Consumption	Cost
Single Rate	2,002 kWh	£200.96

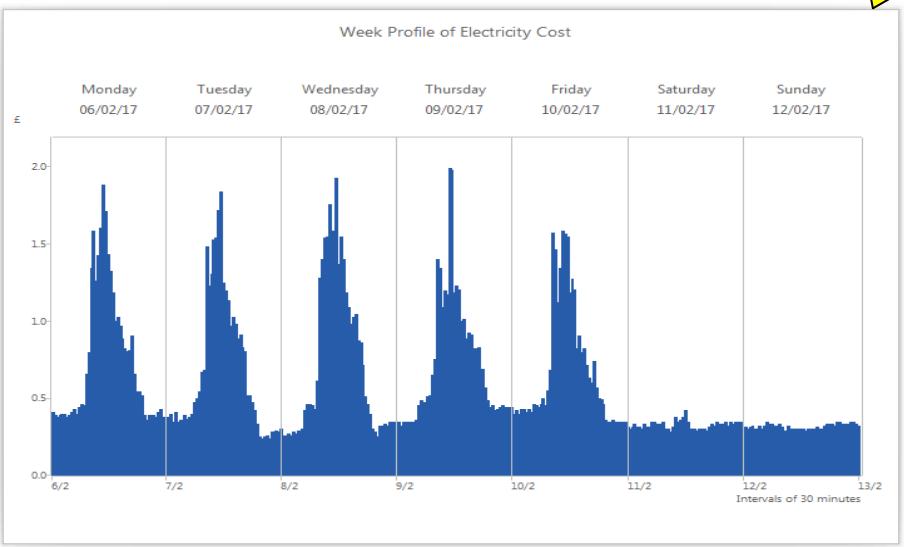
Supply (Estimated) 2,002 kWh £200.96

DUoS Not Charged

Estimated TUoS Not Charged

Availability Charges	@ 1000kVA	£0.00
Standing Charge		£0.00
Settlements Charge		£0.00
Miscellaneous Charge		£0.00
CCL Cost		£11.19
Net Cost		£212.15
VAT Cost (at 20.0%)		£42.43
Estimated Total Cost		£254.59

Company: Solihull MBC - Primary Schools  
 Site: St Patrick's C of E Primary School Academy  
 Full MPAN / Meter ID: S03 1414000041001 / 38470394  
 Online Meter Name: NHH 1414000041001 - 38470394

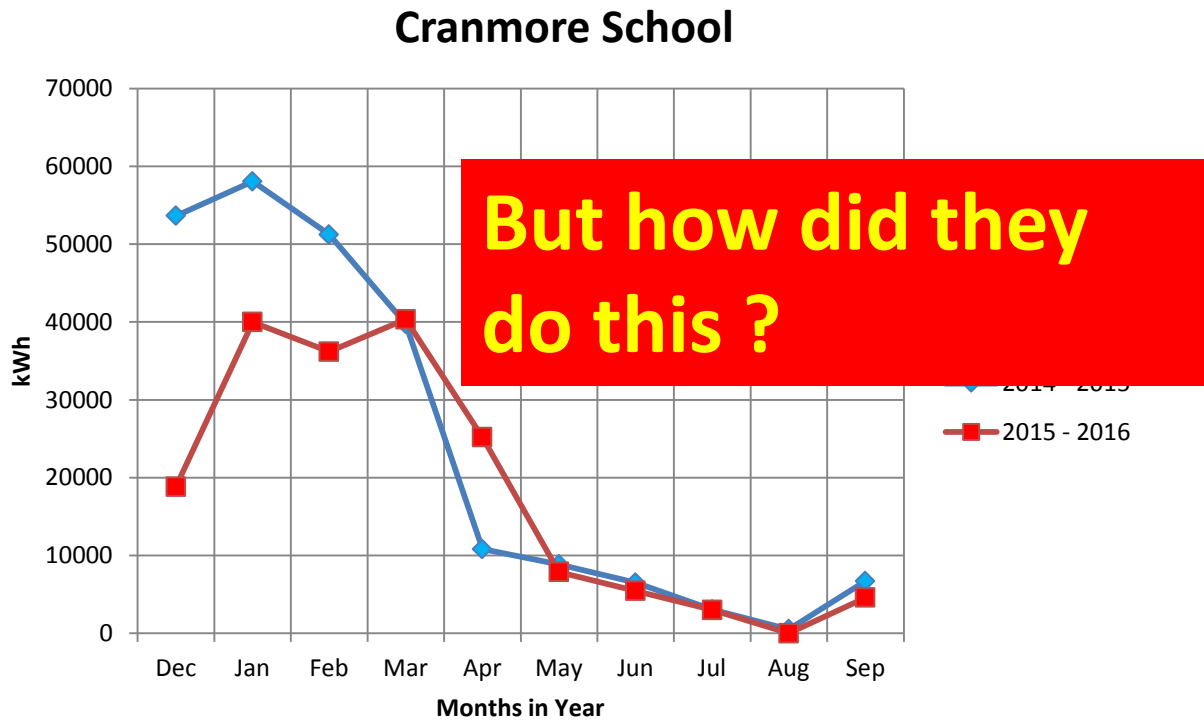


**St Patricks – How? Weekly Cost AMR Profile**



# Energy - Results

## ➤ Cranmore – Year 1 (Gas)



**24%  
down**

**£825  
saving**

Over a 10 month period only

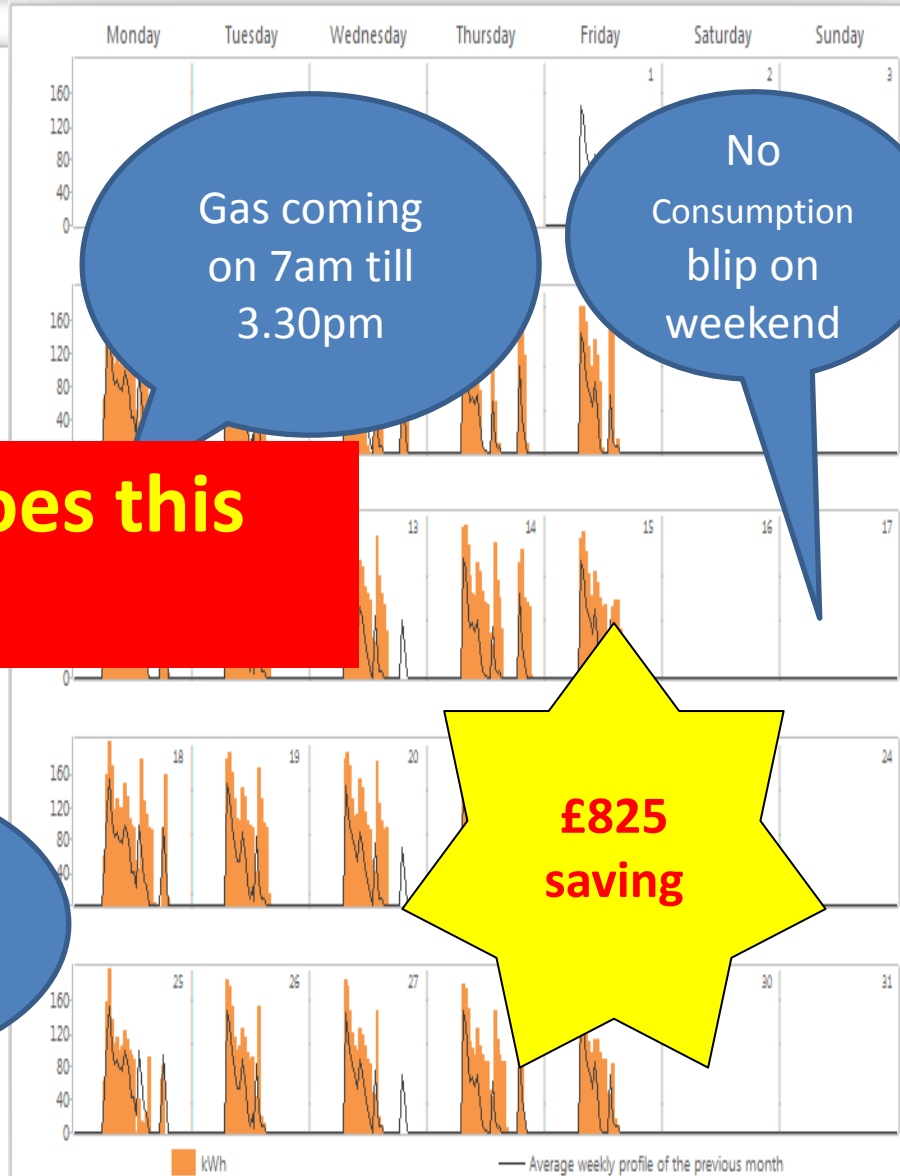
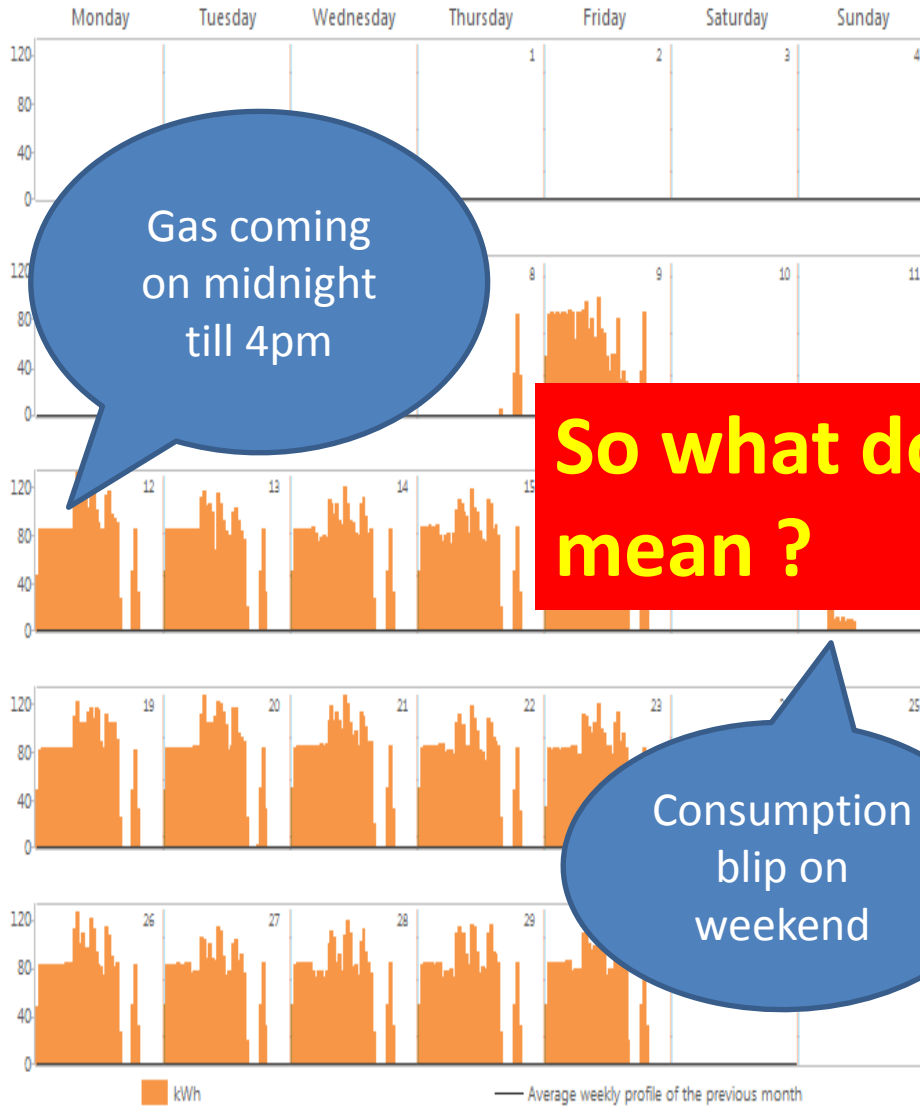
# Jan 2015

## Before

### Cranmore – How? Monthly AMR Profile

# Jan 2016

## After



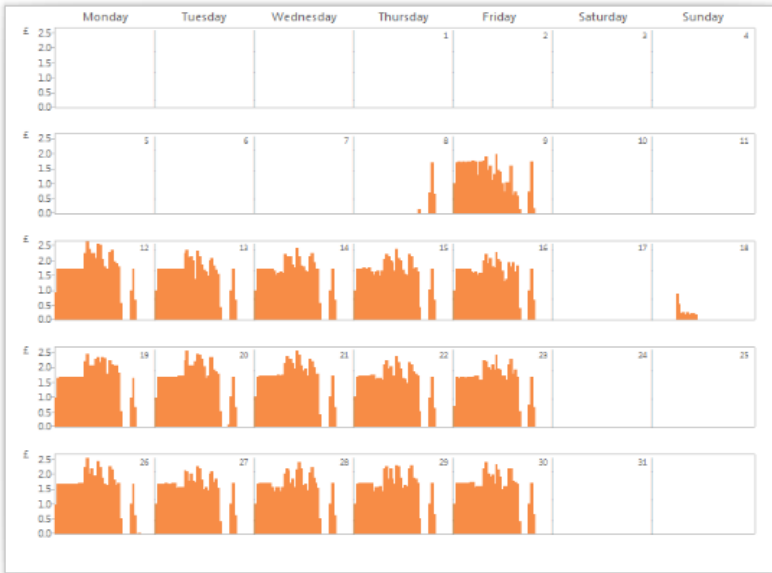
# Cranmore – How? Monthly AMR Profile

# New Cost Profile Report Monthly

Jan 2015

**Before**

**← £1,296**



Usage Charge  
47,697.2 kWh  
@ 2,000 p/kWh      £953.94

Other Charges  
Standing Charge @ 120.0 p/day      £37.20  
CCL Cost      £89.67

Net Cost      £1,080.81  
VAT Cost (at 20.0%)      £216.16

**£200 saving**



Other  
Standing Charge @ 120.0 p/day      £37.20  
CCL Cost      £77.18

Net Cost      £914.21  
VAT Cost (at 20.0%)      £182.84

Estimated  
Total Cost      £1,097.05

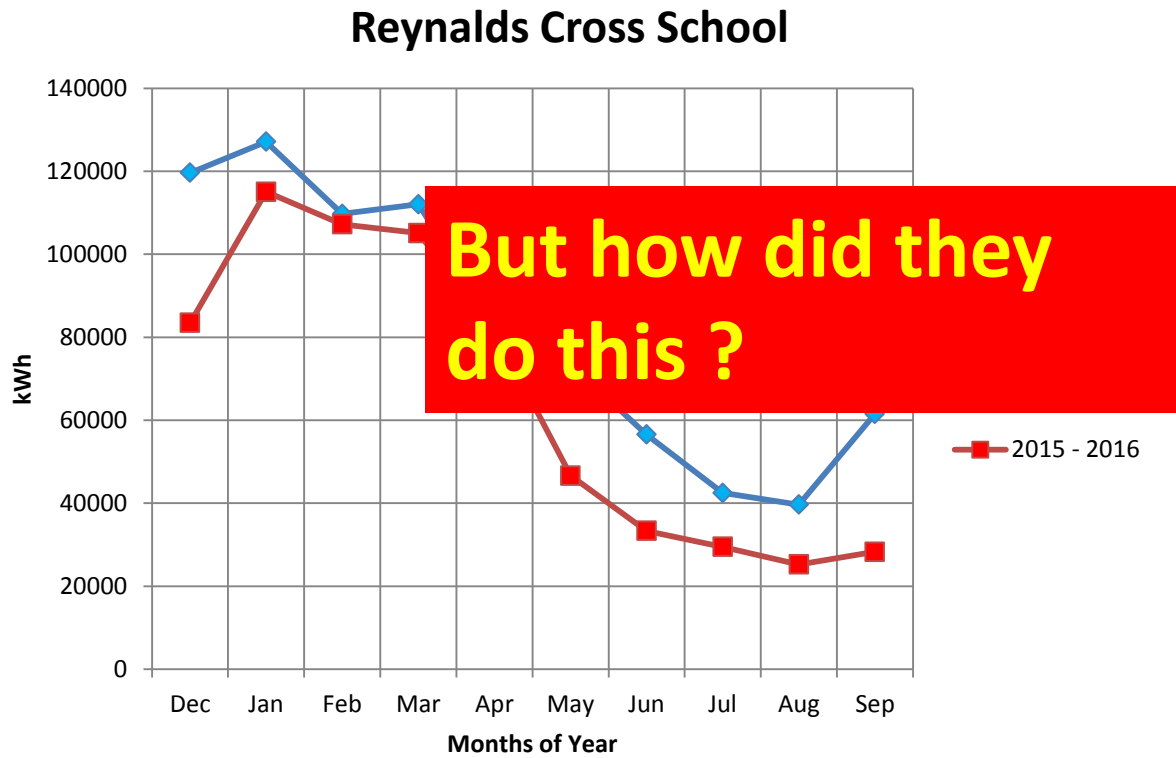
Jan 2016

**After**

**← £1,097**

# Energy - Results

## ➤ Reynalds Cross School – Year 1 (Gas)



**20%  
down**

**£2437  
saving**

Over a 10 month period only

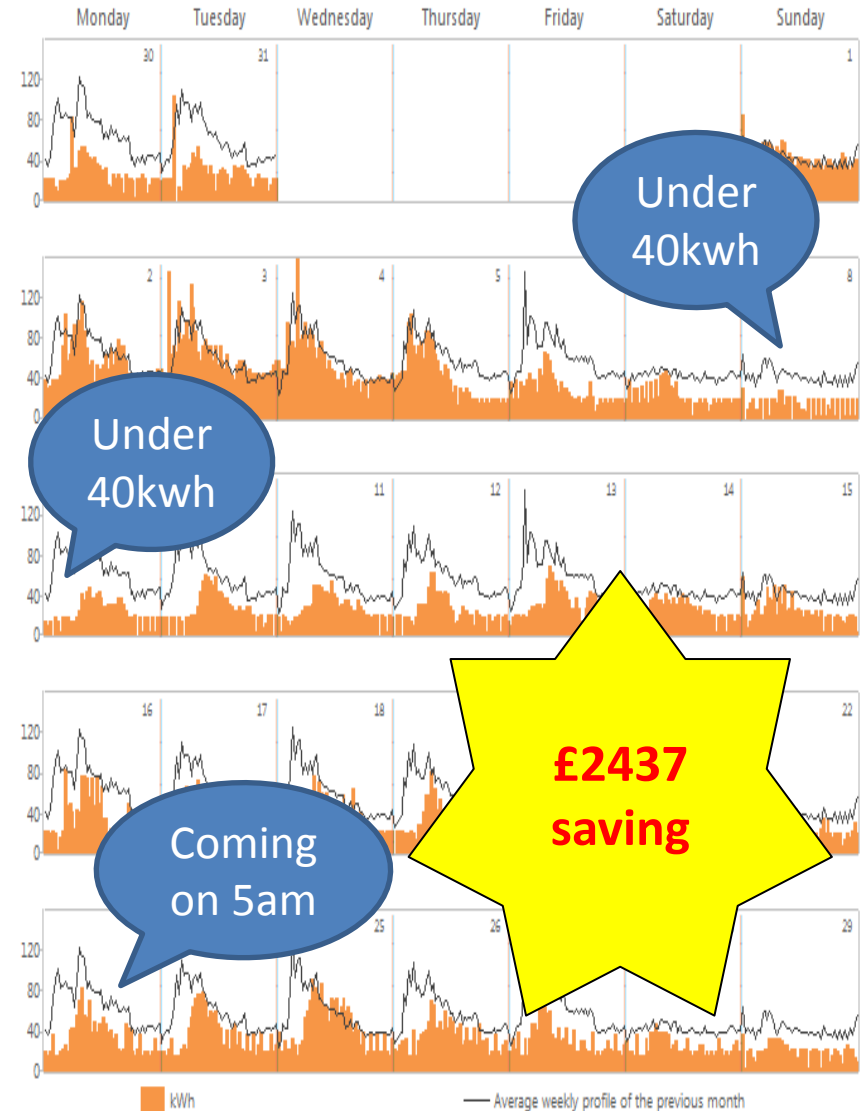
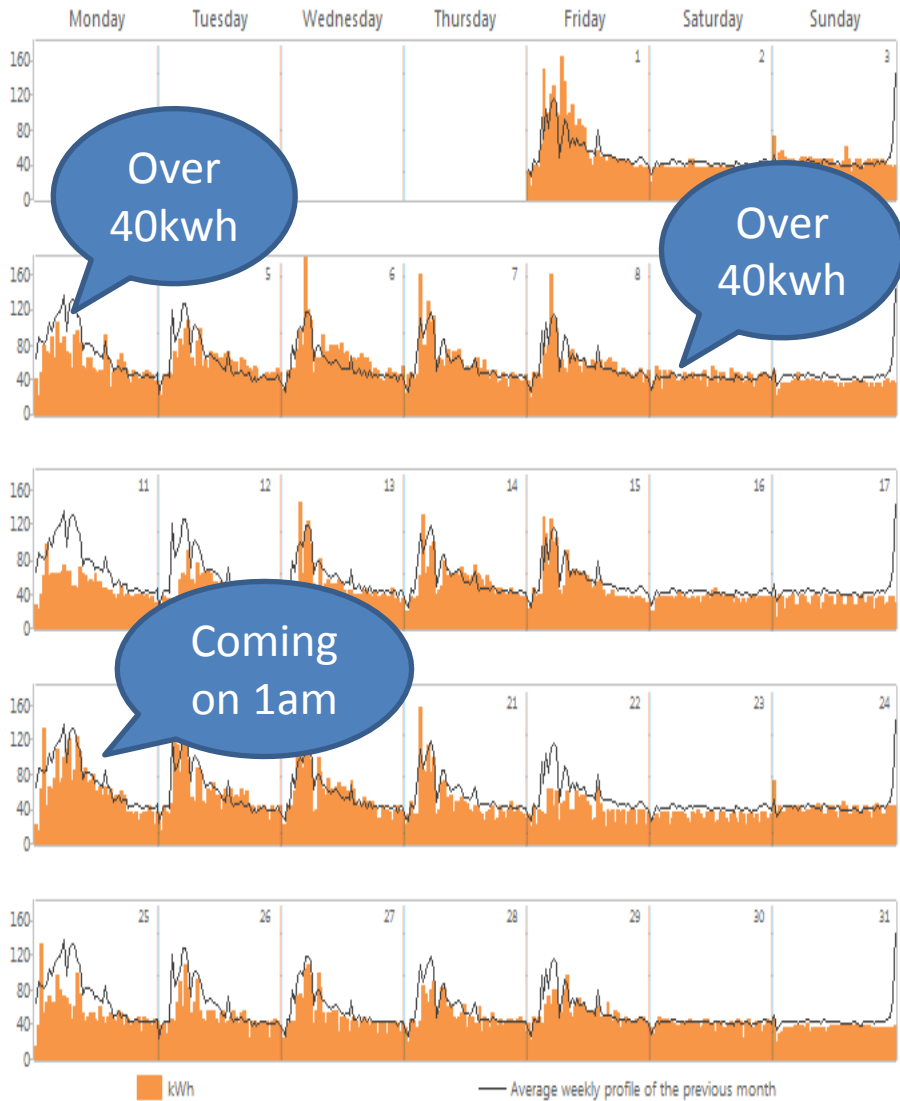
# May 2015

Before

## Reynolds – How? Monthly AMR Profile

# May 2016

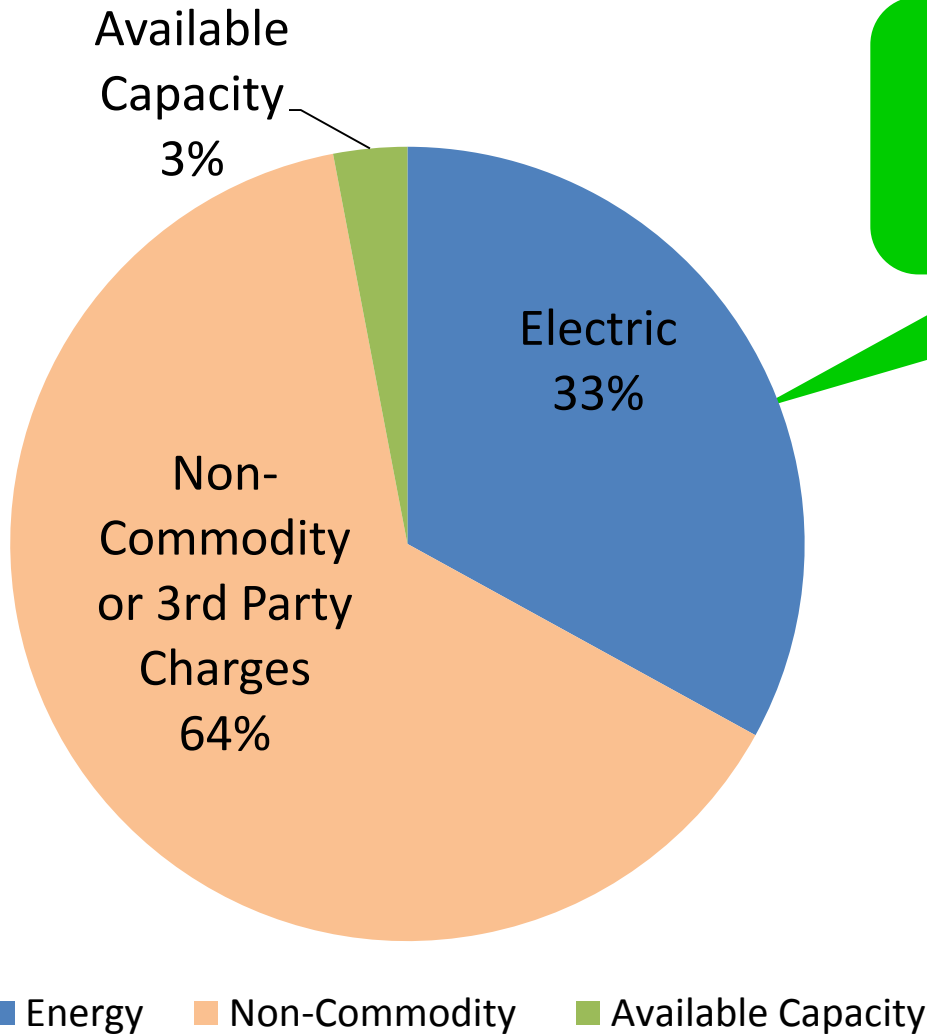
After



# Energy - Legislation



# Energy – Understanding Your Electric Bill



Did you know?  
Up to 64% of your bill is made up of non-commodity charges

- Electric Charge (**33%**)
- Non-Commodity (**64%**) charges like DUOS (13%), TUOS (6%)
- Available Charge (supply capacity kVA) (**3%**)

Non-Commodity / 3<sup>rd</sup> Party Charges – these are charges that make up the energy bill but not for the electric itself.

# Energy – KVA - Reduce your supply capacity costs

## ➤ What is supply capacity?

- The amount of electricity that your Distribution Network Operator (DNO) must provide to your supply at all times. Referred to as the Authorised Supply Capacity, is measured in kVA, and charged monthly for Half Hourly Supplies.
- In April 2018 legislation stated that if Half Hourly metered supplies exceed the Authorised Supply Capacity (ASC), an excess capacity charge will apply (£2.31 per kVA).
- For example, if the Authorised Supply Capacity is set at 100 kVA and the supply uses 110kVA, a 100kVA will be charged at the prevailing rate with the excess (10 kVA) being charged at the higher excess.

Supply Capacity	350 kVA
Peak Capacity Used	315 kVA

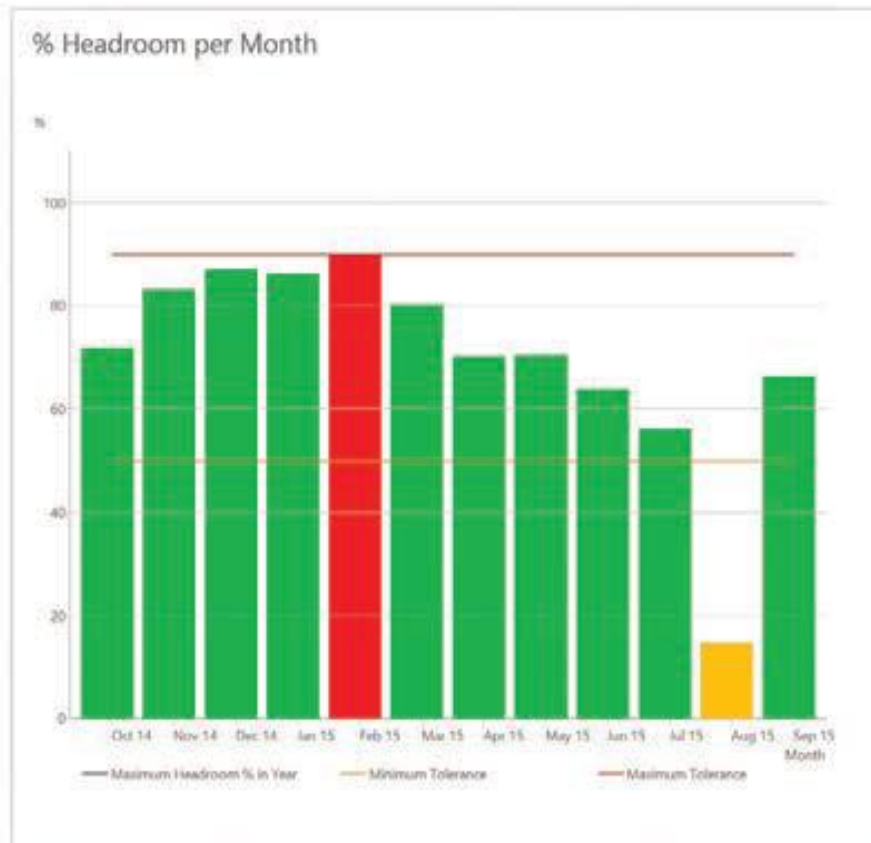
Maximum % Supply Capacity Used in Last 12 Months

90.1%

You are close to exceeding your supply capacity



-  - Above Maximum Tolerance of 90.0%
-  - Below Minimum Tolerance of 50.0%
-  - Between Available Capacity Tolerance



Supply Capacity makes up 3% of your energy bill and is seen on the bill.

Example of **Stark Supply Capacity Report** shows supply capacity set at 350 kVA only hits 315 kVA over 1 yr

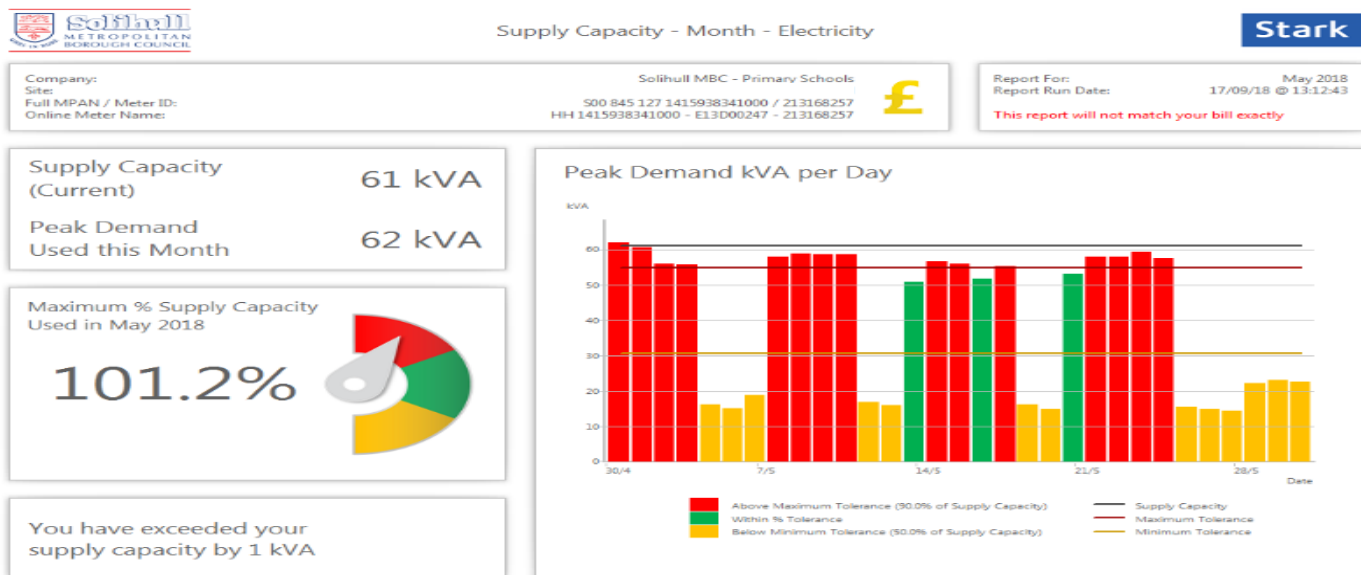


# Energy – KVA - Where can I find Supply Capacity on my bill?

Charge Description	Period of use		Billed Units	Unit Desc	Price	Cost (£)										
	From	To														
<table border="1"> <tr> <td>Supply Number</td> <td>S</td> <td>00</td> <td>845</td> <td>127</td> </tr> <tr> <td></td> <td>14</td> <td>1593</td> <td>8341</td> <td>000</td> </tr> </table>							Supply Number	S	00	845	127		14	1593	8341	000
Supply Number	S	00	845	127												
	14	1593	8341	000												
Meter No. E13D00247																
Day (07:00-24:00)	01/05/18	31/05/18	13,655.50	kWh	11.0980p	1,515.49										
Night (00:00-07:00)	01/05/18	31/05/18	3,094.80	kWh	8.5054p	263.23										
Standing Charge	01/05/18	31/05/18	31.00	Day	118.6801p	36.79										
DUoS Capacity Charge	01/05/18	31/05/18	61.00	kVA/Month	£1.08	65.88										
Excess Capacity Charge	01/05/18	31/05/18	0.74	kVA/Month	£2.31	1.72										
Total (Consumption) 16,750.30 kWh						£1,778.72										
Total Other Charges						£104.39										
VAT at 5.00%						£94.15										
Total Electricity Sales						£1,977.26										

- Half Hourly meter bill will show kVA set 61 kVA @ £1.08 per unit
- Site went over by 0.74 units and gets charged £2.31 per unit

- Stark report shows in May this site goes over kVA
- kVA is set at 61 kVA
- Site went over by less than 1 kVA



# Energy – kVA – Interested to learn more? Want to find out what you kVA is?

Site Name	kVA Oct 2017	kVA Nov 2017	kVA Dec 2017	kVA Jan 2018	kVA Feb 2018	Supply Capacity kVA
Alderbrook School and Arts College	260.07	319.4	326.71	330.18	324.83	350
Arden Academy	277.1	291.89	294.93	289.18	277.52	500
Balsall Common Primary School	59.49	64.6	65.2	68.93	65.06	61
Bishop Wilson Church of England Primary School	69.36	87.43	87.74	97.74	108.95	400
Blossomfield Infant and Nursery School	29.99	30.01	31.42	29.76	29.84	80
Bosworth Wood Primary School	36.98	47.08	49.15	48.79	58.97	100
Castle Bromwich Infant School	44.12	52.97	53.07	55.89	54.61	56
Chapel Fields Junior School	38.33	44.02	43.89	44.99	44.26	1
Coleshill Heath Primary School	74.49	78.42	87.31	84.37	79.66	260
Daylesford Infant School	36.69	35.63	36.5	34.28	40.52	41
Dorridge Junior School	49.8	51.62	52.04	54.08	56.45	66
Dorridge Nursery and Infant School	39.34	47.88	47.78	55.82	50.26	53
Fordbridge Community Primary School	76.8	98.95	96.12	105.54	115.34	260
Forest Oak School and Merstone School	145.19	156.63	166.61	174.28	163.8	250
Haslucks Green School	43.47	48.14	52.58	54.08	47.57	48
Hazel Oak School	60.74	74.04	76.13	79.93	77.99	100
Heart of England Business and Enterprise School	190.29	196.42	201.36	206.05	204.21	330
John Henry Newman Catholic College	222.15	226.66	237.56	237.58	244.84	750
Kingshurst Primary School	57.46	64.56	62.83	63.04	63.85	275
Lady Katherine Leveson Church of England School	43.44	45.46	46.65	46.75	47.35	125
Langley School	207.7	217.38	216.33	210.11	219.48	242
Light Hall School Specialist Mathematics & Computing College	222.11	243.13	237.12	235.34	230.22	430
Lode Heath School and Sports College	184.2	237.2	201.8	204.6	204.5	200
Marston Green Infant School	38.72	41.28	39.89	49.93	48.06	48
Marston Green Junior School	47.42	55.56	52.26	59.34	53.2	59
Monkspath Junior and Infant School	68.46	74.66	81.76	82.8	76.96	91
Northern House School	56.6	58.34	57.33	62.26	58.27	250
Park Hall School	250.39	240.41	238.3	254.5	234.55	250
Peterbrook Primary School	44.41	60.83	52.68	61.99	66.18	52
Reynolds Cross School	68.83	77.22	75.75	82.39	84.06	89
Smiths Wood Community Primary School	76.46	82.93	80.56	84.4	86.17	275
Smiths Wood Sports College	220.09	231.17	239.71	238.02	235.4	300
St Annes School	70.87	70.89	76.27	81.47	84.16	150
St Antonys Catholic Primary School	32.96	38.65	36.43	39.76	39.11	38
St Peters Catholic School and Specialist Science College	187.59	195.68	203.34	219.5	206.27	220
The Sixth Form College Solihull	324.75	385.33	444.39	440.41	478.41	700
Tidbury Green School	40.71	40.98	39.15	45.01	42.03	36

Pop and see me later we can discuss!

Chart Shows – Various sites kVA, from Oct 2017 to Feb 2018 and in red who has exceeded?

## Energy – DUOS & TNUOS charges

Your Supplier purchases electricity from generation companies on your behalf.

The Supplier is then charged by the National Transmission Network and Distribution Network Operators who deliver electricity to your premises. The Supplier passes these charges to the customer and these charges are known as DUoS and TNUoS

### DUOS?

#### Distribution Use Of System

What - Recovers the cost of installing and maintaining the local distribution network

How?

Your charge is based on the volume of electricity which has passed through the distribution network that is consumed at site. Rates vary depending on your region & time of day, represented by red, amber, green scale of charges.

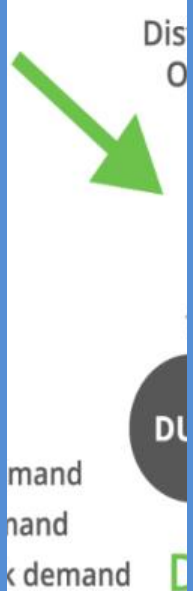
### TNUOS?

#### Transmission Network Use of System

What - Recovers the cost of installing and maintaining the transmission system in England.

How?

Your charge is based on your share of demand on the transmission network during its peak periods.



# What Are DUOS Charges?

## Energy – DUOS – Distribution Use of Systems

Western Power Distribution (West Midlands) plc - Effective

### Time Bands for Half Hourly Metered Properties

Time periods	Red Time Band	Amber Time Band	Green Time Band
Monday to Friday	16:00 to 19:00	07:30 to 16:00 19:00 to 21:00	00:00 to 07:30 21:00 to 24:00
Weekends			00:00 to 24:00

Notes

All the above times are in UK Clock time

#### RED

When electricity is in high demand, normally between 16:00 and 19:00 on weekdays. This is the most expensive charge.

#### AMBER

When electricity is in moderate demand, normally daytime and evenings on weekdays and weekends. This charge is less expensive.

#### GREEN

When electricity is in low demand, normally night time for weekdays and weekends. This charge is minimal.

#### What do you pay?

Each Distribution Network has set prices for their times for the Red, Amber and Green periods in pence/kWh.

#### Minimising your costs

Reducing your consumption during the most expensive times of day by shifting load to other times can save you money.

# Energy – DUOS – Distribution Use of Systems

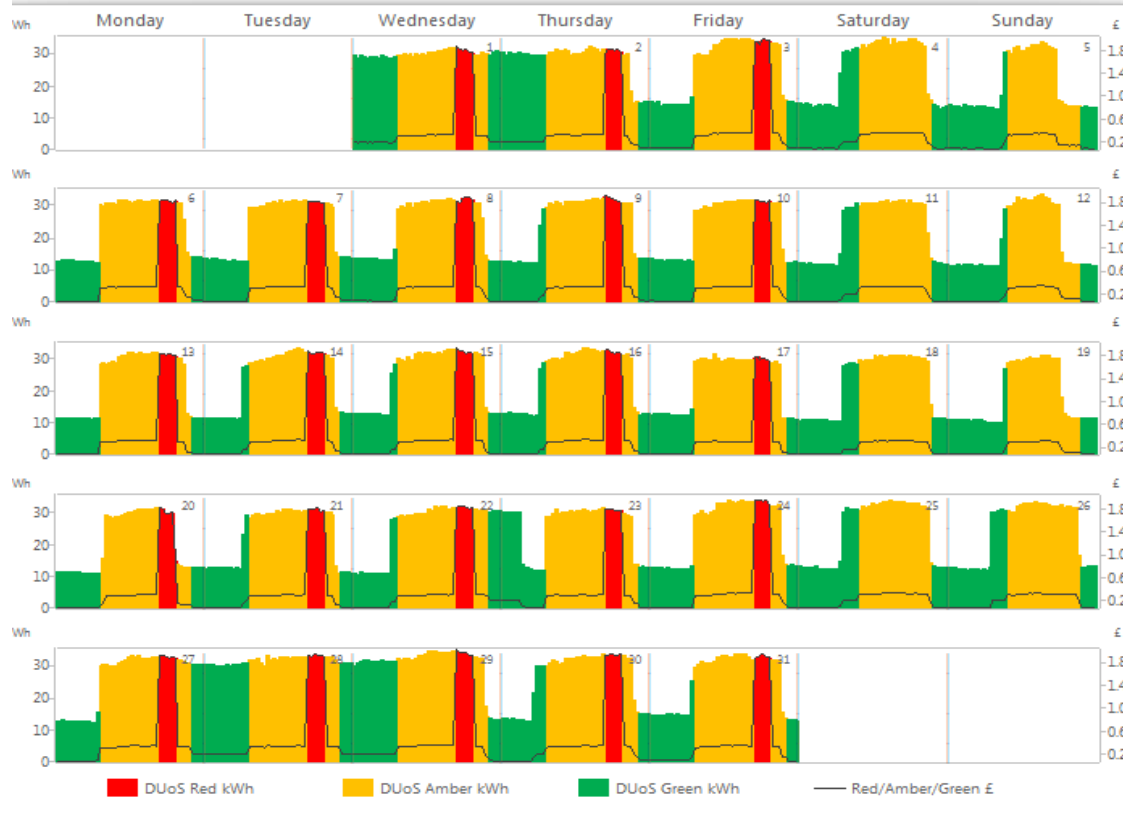
## Example – RAG Chart Monthly Cost

Company:  
Site:  
Full MPAN / Meter ID:  
Online Meter Name:



Report For: Aug 2018  
Report Run Date: 17/09/18 @ 12:28:05

This report will not match your bill exactly



### DUoS Consumption

Red	4,342 kWh
Amber	21,957 kWh
Green	9,745 kWh

Estimated DUoS Consumption 36,044 kWh

### DUoS Cost

Red	@ 5.889 p/kWh	£255.67
Amber	@ 1.032 p/kWh	£226.60
Green	@ 0.655 p/kWh	£63.83

Standing Charge		£3.13
Availability Charges	94 kVA	£69.35
Availability Charges Excess	0 kVA	£0.00
kVArh > 33%		£0.00

Estimated DUoS Cost £618.59

# Energy – DUOS – Distribution Use of Systems

## Example – RAG Chart Daily Cost

SavenergyOnline  
Powered by Stark

Energy Profile - Day by Interval - DUoS - Electricity

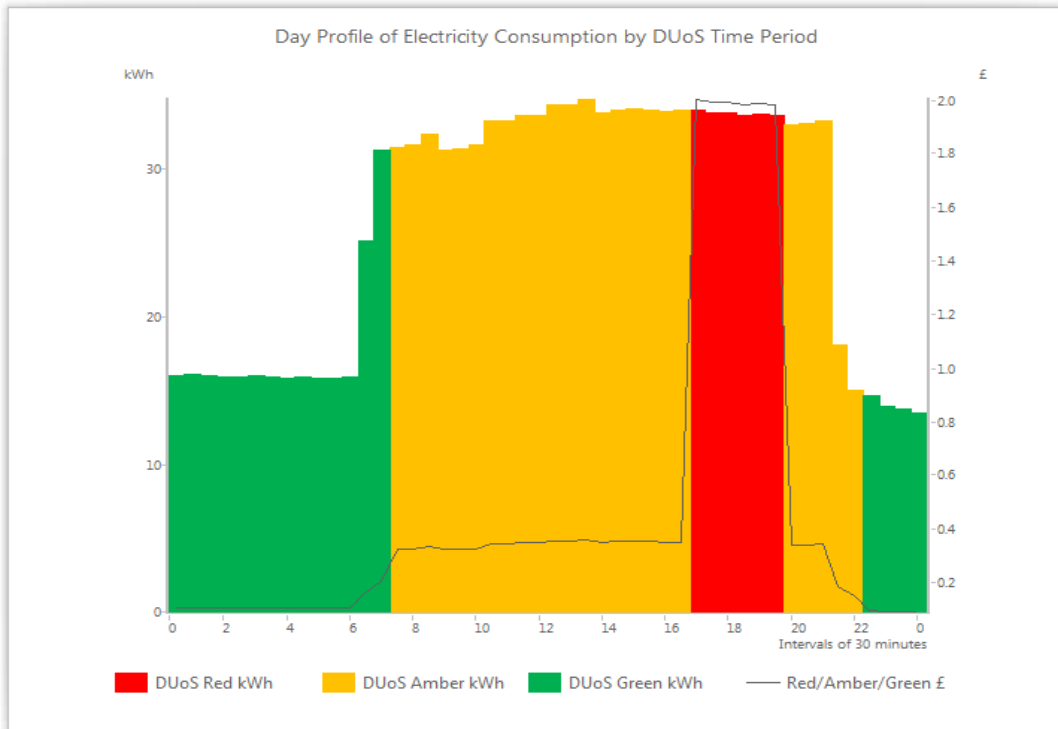
Stark

Company:  
Site:  
Full MPAN / Meter ID:  
Online Meter Name:



Report For: Fri 14/09/18  
Report Run Date: 17/09/18 @ 12:25:13

This report will not match your bill exactly



Time	kWh	Time	kWh
00:30	16.05	12:30	34.32
01:00	16.18	13:00	34.37
01:30	16.11	13:30	34.65
02:00	15.97	14:00	33.80
02:30	15.86	14:30	34.04
03:00	16.10	15:00	34.09
03:30	15.95	15:30	34.04
04:00	15.80	16:00	33.88
04:30	15.93	16:30	33.98
05:00	15.79	17:00	33.97
05:30	15.85	17:30	33.86
06:00	15.93	18:00	33.86
06:30	25.14	18:30	33.64
07:00	31.31	19:00	33.74
07:30	31.52	19:30	33.68
08:00	31.63	20:00	32.98
08:30	32.40	20:30	33.01
09:00	31.31	21:00	33.21
09:30	31.41	21:30	18.03
10:00	31.62	22:00	14.99
10:30	33.30	22:30	14.68
11:00	33.31	23:00	14.02
11:30	33.66	23:30	13.72
12:00	33.68	00:00	13.49

	Rate p/kWh	Consumption kWh	Cost £
Red	5.889	203	11.94
Amber	1.032	763	7.88
Green	0.655	304	1.99
<b>Total</b>		<b>1,270</b>	<b>21.81</b>

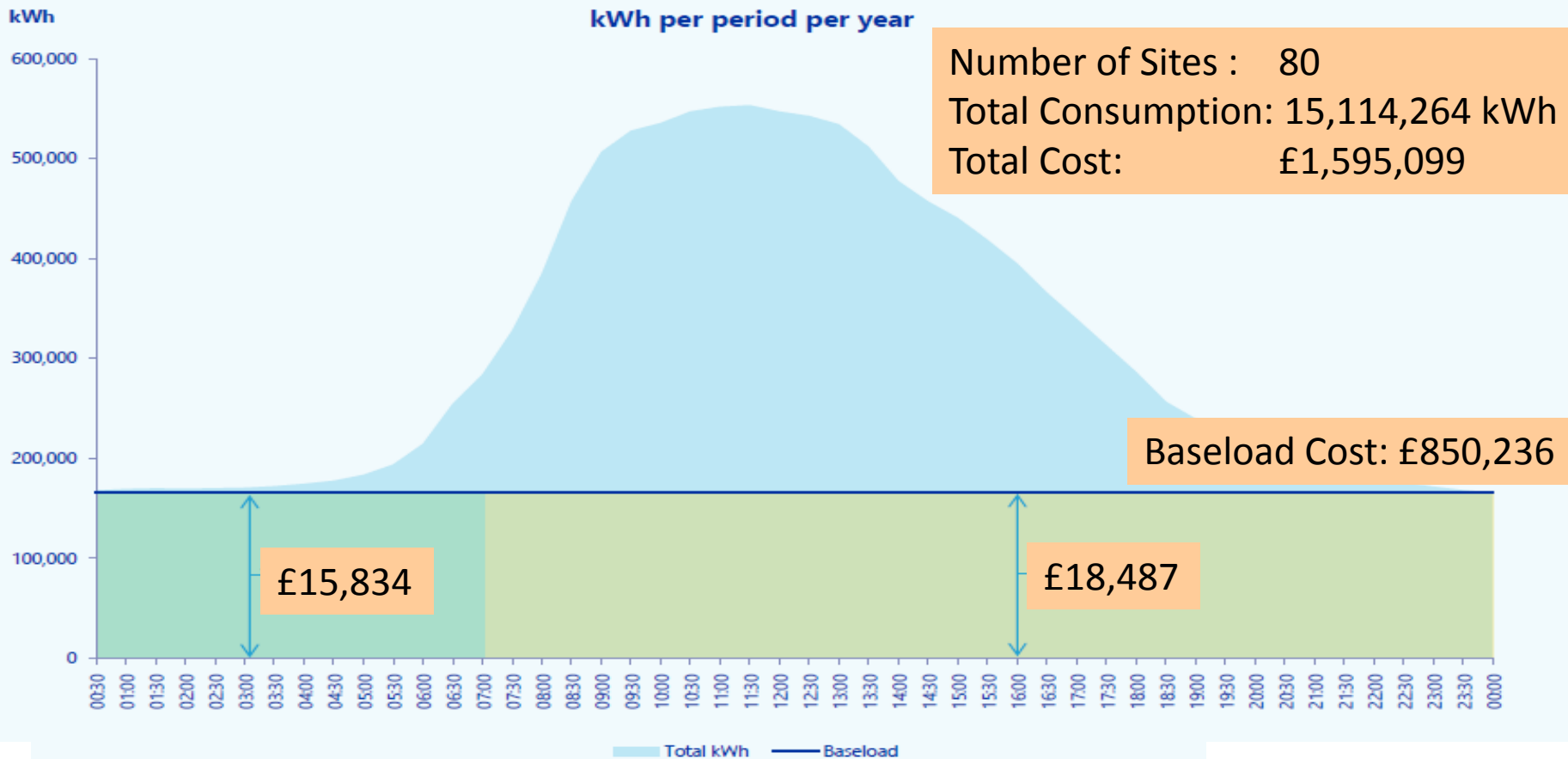
Report Time Zone: (UTC+00:00) Dublin, Edinburgh, Lisbon, London (With Daylight Saving)

# Energy – Interesting Graphs



# Energy – Electric Baseload?

## Schools – Overall Load

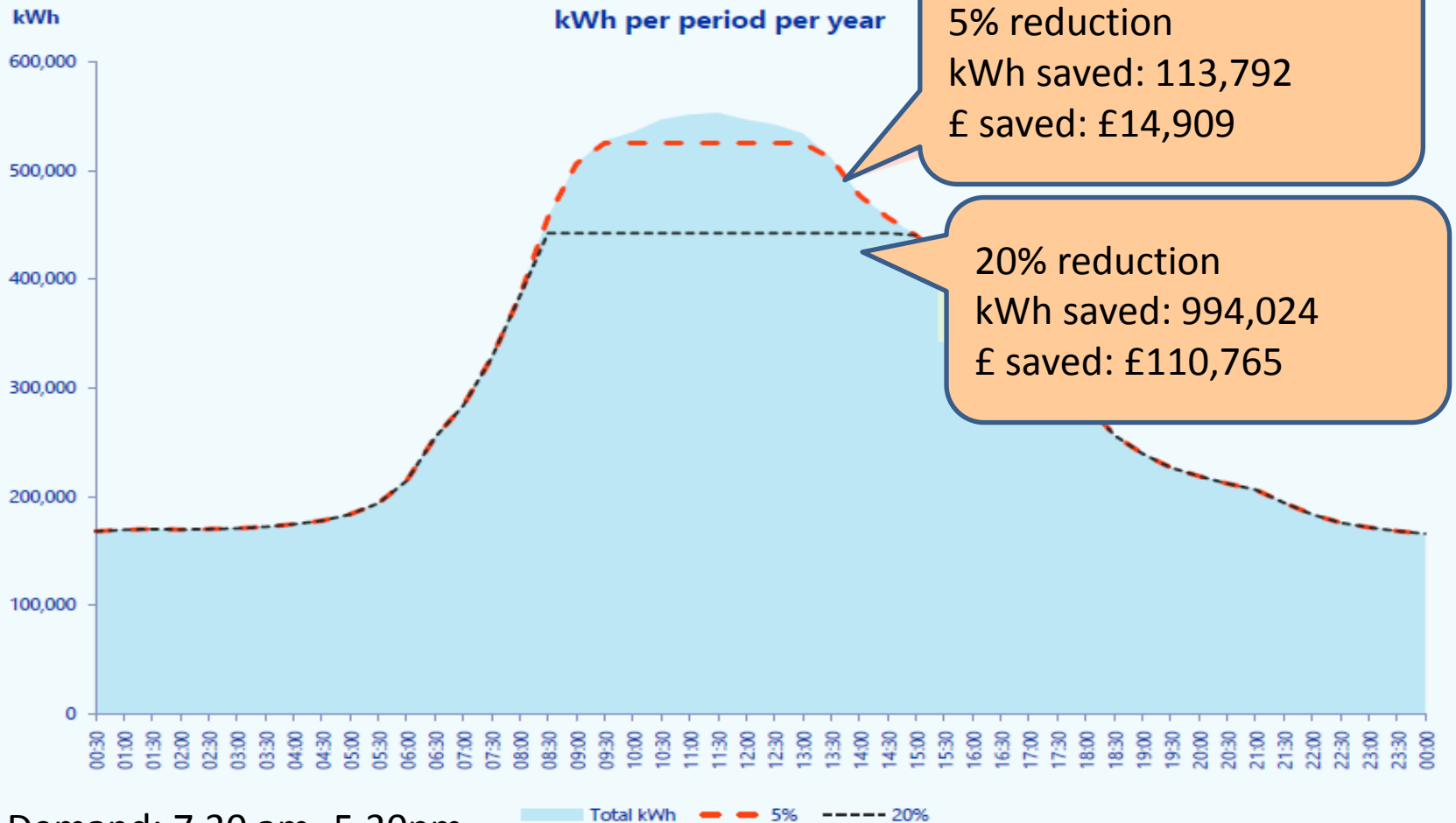


80 Schools over 12 month period



# Energy – Electric Core Demand?

## Schools – Potential Core Demand Savings




# Cost £ V Consumption?

“Cost Profile-Month by Interval-electricity”

Company:  
 Site:  
 Full MPAN:  
 Online:

S 1470000353911 / K13W304674  
 HH 1470000353911 - K13W304674 (VISO214)



Report For: May 2015  
 Report Run Date: 05/06/15 @ 14:07:50

Consumption doesn't tell you the whole story  
**Sometimes?**



**£49.08**  
**Day**

**£9.32**  
**Night**

Supply		
Day (07:00-00:00)	12.000 p/kWh	£49.08
Night (00:00-07:00)	5.500 p/kWh	£9.32
Estimated Supply Cost		£58.40
DUoS		
Red		£0.00
Amber		£0.00
Green		£0.00
Standing Charge		£0.00
Availability Charges	1000kVA	£0.00
Availability Charges Excess	0kVA	£0.00
kVAh > 33% < 90% Charge		£0.00
kVAh > 90% Charge		£0.00
Estimated DUoS Cost		£0.00
TUoS		
0.00kW @ £0.000/kW/day		£0.00
AAHEDC Charge		£0.00
Standing Charge		£9.30
Settlements Charge		£0.00
Miscellaneous Charge		£0.00
CCL Cost		£3.20
Net Cost		£70.90
VAT Cost		£14.18
Estimated Total Cost		£85.08

£1881.27

Day

£409.67

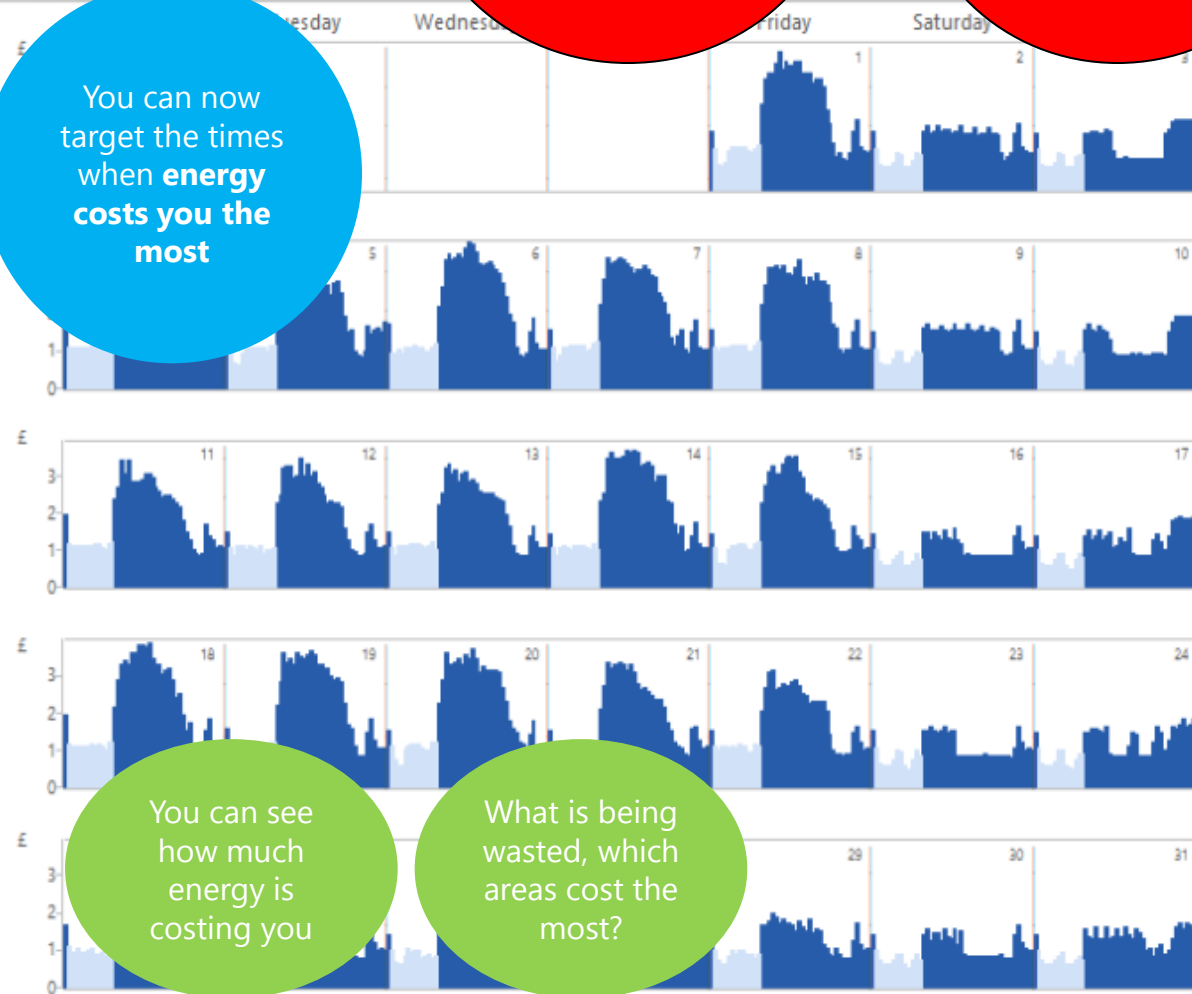
Night

You can now target the times when energy costs you the most

You can see how much energy is costing you

What is being wasted, which areas cost the most?

Online Meter Name: 1460001



Supply

Day (07:30-00:30)	10.155 p/kWh	£1,881.27
Night (00:30-07:30)	6.066 p/kWh	£409.67

Estimated Supply Cost £2,290.95

DUoS Not Charged

TUoS Not Charged

Availability Charges	@ 275kVA	£265.98
Standing Charge		£107.26
Settlements Charge		£0.00
Miscellaneous Charge		£75.58
CCL Cost		£140.05
Net Cost		£2,879.82
VAT Cost		£575.96
Estimated Total Cost		£3,455.78

# School's gas consumption shows scope for significant savings £



nline  
Powered by Stark

Profile - Week by Interval - Occupancy - Total Energy- Manual Y Axis

## Weekly Profile Occupancy V Consumption



Report For:  
Report Run Date:

On Sunday, building is unoccupied and gas is consumed from midnight till 4am

■ Elec Unoccupied  
■ Elec Shoulder  
■ Elec Core  
■ Gas Unoccupied  
■ Gas Shoulder  
■ Gas Core  
■ Preheat of 1.5 Hours

Date	kWh	Av Unoc.	Av Shou.	Av Core	Av Preheat
05/01/15	9,891	56.1	199.8	338.8	219.6
06/01/15	10,102	58.1	210.8	349.5	166.6
07/01/15	10,431	55.6	208.3	365.0	226.3
08/01/15	9,997	53.6	207.2	350.6	170.7
09/01/15	9,682	52.0	197.0	338.5	189.1
10/01/15	4,513	94.0	-	-	-
11/01/15	6,033	125.7	-	-	-
Week	60,650	100.3	204.6	348.5	194.5



Potential week saving:  
**£108**

Report Time Zone: (UTC) Dublin, Edinburgh, Lisbon, London (With Daylight Saving)