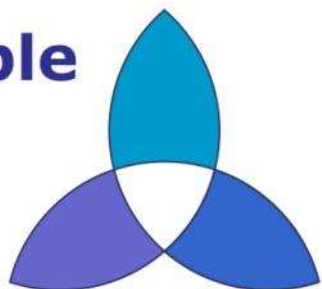


**Sustainable Business Breakfast**

# **Energy Efficient Technologies**

**Eastbourne, 10<sup>th</sup> July 2014**

**Sustainable  
Business  
Network**



Working in partnership with:

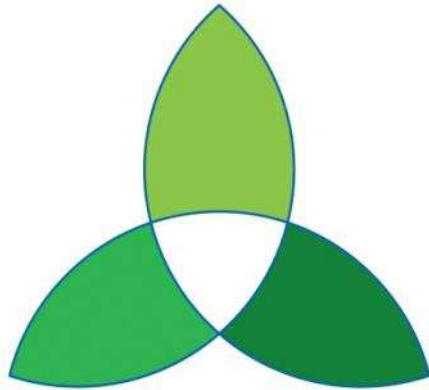
**GreenGrowth  
PLATFORM**



**University of Brighton**

Supported by:

HIGHER EDUCATION  
FUNDING COUNCIL *hefce* FOR ENGLAND

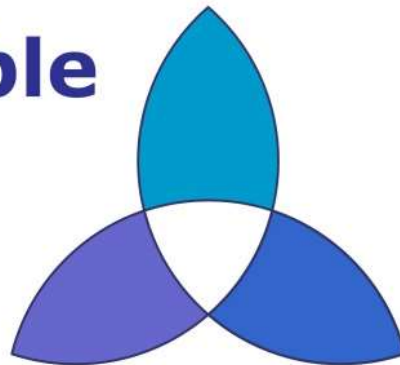


# Sustainable Business Partnership

Community Interest Company

Working in partnership...

**Sustainable  
Business  
Network**



Green **Growth**  
**PLATFORM**



**University of Brighton**

# What's coming up?

**08:30 Welcome**

Rowan Wallis, Sustainable Business Partnership CIC

**08:35 LED Lighting Demonstration**

Matthew Rutherford, Infinity Lighting Solutions

**08:50 Energy Sub-metering and Monitoring**

Jason Pritchard, Marshall Tufflex & Tony Verrall, Uniq Solutions

**09:05 Best Practice Case Study**

Fred Furner, Wave Leisure

**09:20 Round-the-Tables**

**09:30 Networking & Refreshments**

**Sustainable Business Breakfast**

**Energy Efficient  
Technologies**



**INFINITY**  
Lighting Solutions

# LED LIGHTING

SUSTAINABLE BUSINESS BREAKFAST  
- ENERGY EFFICIENT TECHNOLOGIES

# WHAT IS AN LED?



- Light emitting diode
- Originally designed in Russia in 1927
- Commercially and financially available in 1968
- Semi-conductors that pass a direct current across the cathode and anode to create light radiation.

# ENERGY USAGE



- LED'S consume much less energy than incandescent, tungsten, metal halide and many other lamp types
- Much larger percentage of the input energy converted into light rather than heat.

## Example:

- Traditional 50 Watt halogen lamp emits on average 400 lumens  
= 8 lumens per Watt
- Modern 5 Watt LED emits 500 lumens  
= 100 lumens per watt

# THE DIRECTION OF LIGHT

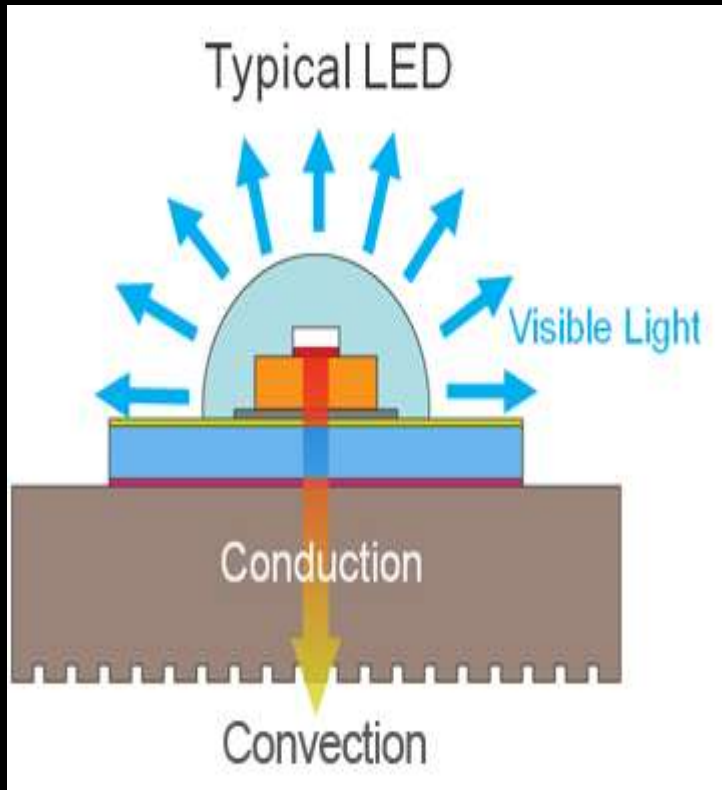


Efficiency is more than just saving energy, its about using the output in a more effective way!

- Custom lens technology allows variation of beam angles
- Achieve more light with fewer lamps
- Effective in retail and commercial environments where light is generally needed in specific areas.

The direct sight of an LED can sometimes create glare, but by using prismatic or frosted lenses this is reduced considerably.

# THE LIFESPAN OF LED'S



- Long lifespan to do with thermal management
- Heat sink normally fixed behind the PCB (printed circuit board) to conduct heat away from the diode
- LED's work perfectly in low temperature environments - the colder the semi conductor the longer it will last
- Lifespan increasing as technology progresses heat sinks become more efficient

Domestic LED's average lifespan  
= 35,000 hours

Commercial LED's average lifespan  
= 75,000 hours

# MAINTENANCE

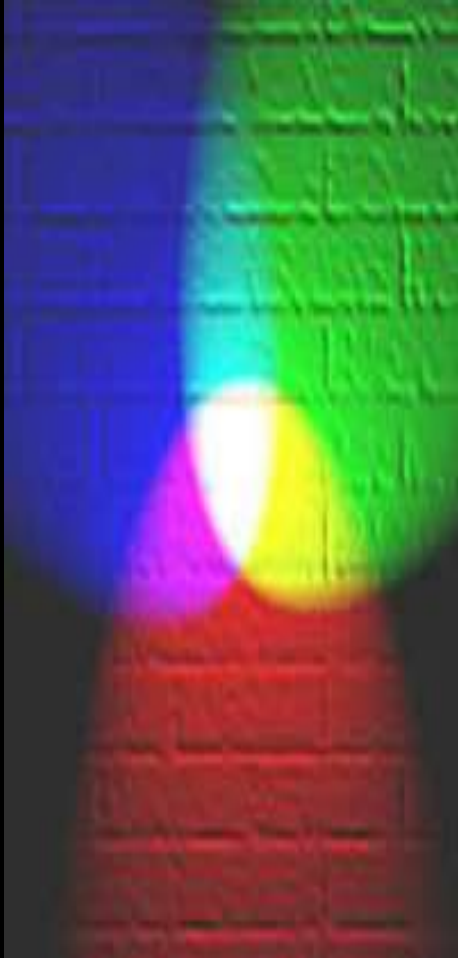


- LED maintenance is negligible, if heat is managed properly and the diodes are manufactured to a high enough quality.
- The weakest, and most active, part of an LED is the driver, which converts mains voltage down to 12 or 24 volts.
- Expected lifespan mainly based on how long the driver will last rather than the diode.
- With non LED lamps total lamp replacement sometimes required to ensure uniformity
- With LEDs annual Light loss factor (LLF) is unnoticeable

# PAY BACK

	<b>Non LED</b>	<b>LED</b>
Number of luminaires	300	300
Wattage per luminaire	72 W	18 W
Electricity consumption	21.6 kWph	5.4 kWph
Cost of electricity	15 p/kWh	15 p/kWh
Cost per hour	£3.24	£0.81
Cost per day	£25.92	£6.48
Cost per year (350 days)	£9,072	£2268
Initial investment		= £8,700
Annual saving		= £6,804
Payback period		= 1.27 years

# SPECIALIST LED



- Wondering why all the text has been themed around the primary colours RED, GREEN and BLUE?
- Using colours can add to image and the way an environment feels
- Humans react to different colours of light via sensory receptors meaning RGB is a good way to stand out.
- RGB is controlled is through a DMXI (Digital multiplex interface) which can be programmed by computers to precise instruction to the LED.



# DEMONSTRATION AND QUESTIONS

We will now demonstrate some LED products

Any questions are welcome

**Sustainable Business Breakfast**

**Energy Efficient  
Technologies**

# *Sub-Metering & Monitoring*

*Uniq Solutions & Marshall Tufflex*

Monitor - Understand - Control



# Bills

Electric

Gas

Water



- Do you know where it all goes?
- Do you think you could reduce your consumption?
- Do you know how much your larger circuits or processes cost?
- Do you know where to begin?



**Marshall Tufflex** [Your Logo]

- Main Heating
- Plant Gas Flow
- Plant Water Flow

Temperature controls: 19.5°C OFF, 19.5°C ON, 19.5°C ON, 19.5°C ON, 19.5°C ON, 19.5°C ON.

**WiTec**

Temperature controls: 19.5°C OFF, 19.5°C ON, 19.5°C ON, 19.5°C ON, 19.5°C ON, 19.5°C ON.

**Entel** [Your Logo]

- Wind Turbine Fan
- Sub Plant
- CHP
- Plant Gas Flow
- Sub Gas Flow
- Sub Gas Flow
- Sub Gas Flow
- Sub Gas Flow
- Sub Gas Flow
- Sub Gas Flow

Cost indicators: £ 800.00, £ 800.00, £ 800.00, £ 800.00.

**GILBERTSON & PAGE LTD.**  
Established in 1853

Powered by **Uniq solutions**

# Live data

Energy data can be viewed on-line through a dashboard, which can be customised for your organisation.



# Automated reporting

The software can be set to automatically create reports to show energy consumption

SMS email



# Automated Alarms

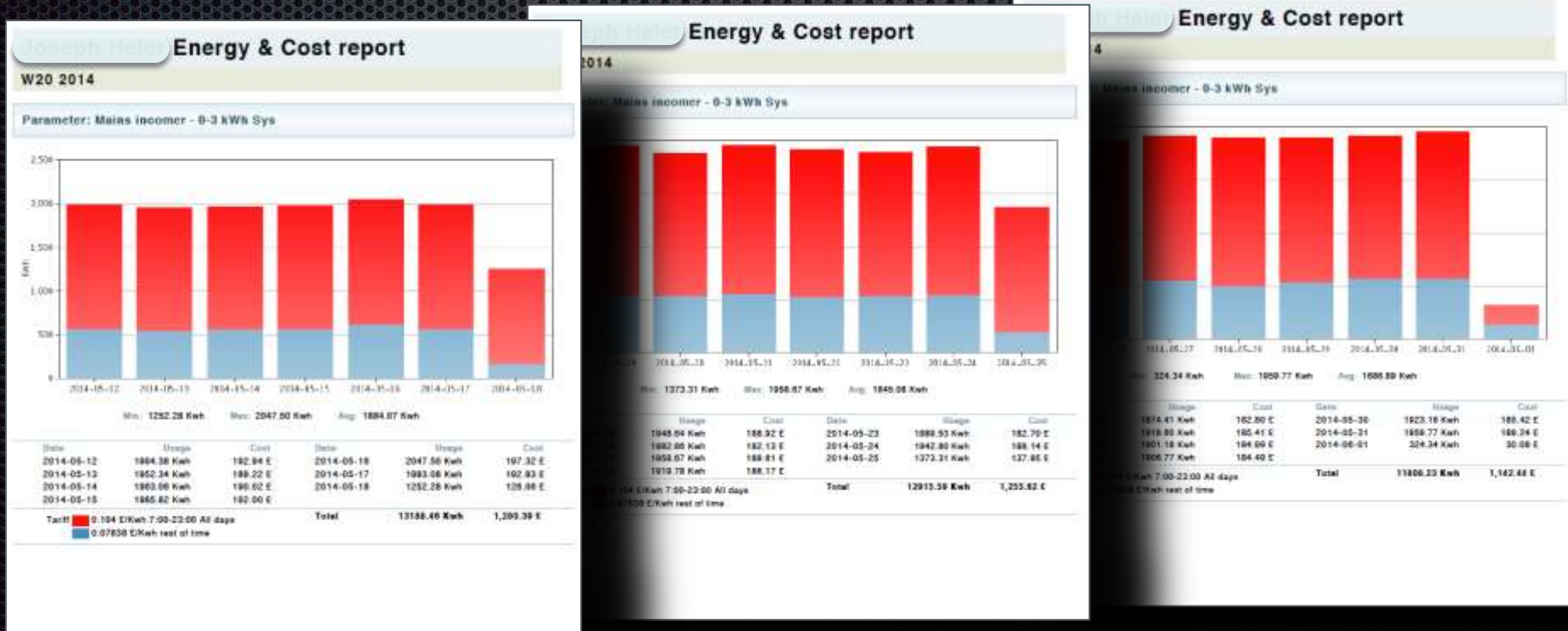
Ensure you know when there is an issue before it becomes a major problem!

# Finding Trends

The weekly energy reports below show information on a single circuit of a cheese dairy who only work day time shifts of 7am - 7pm.

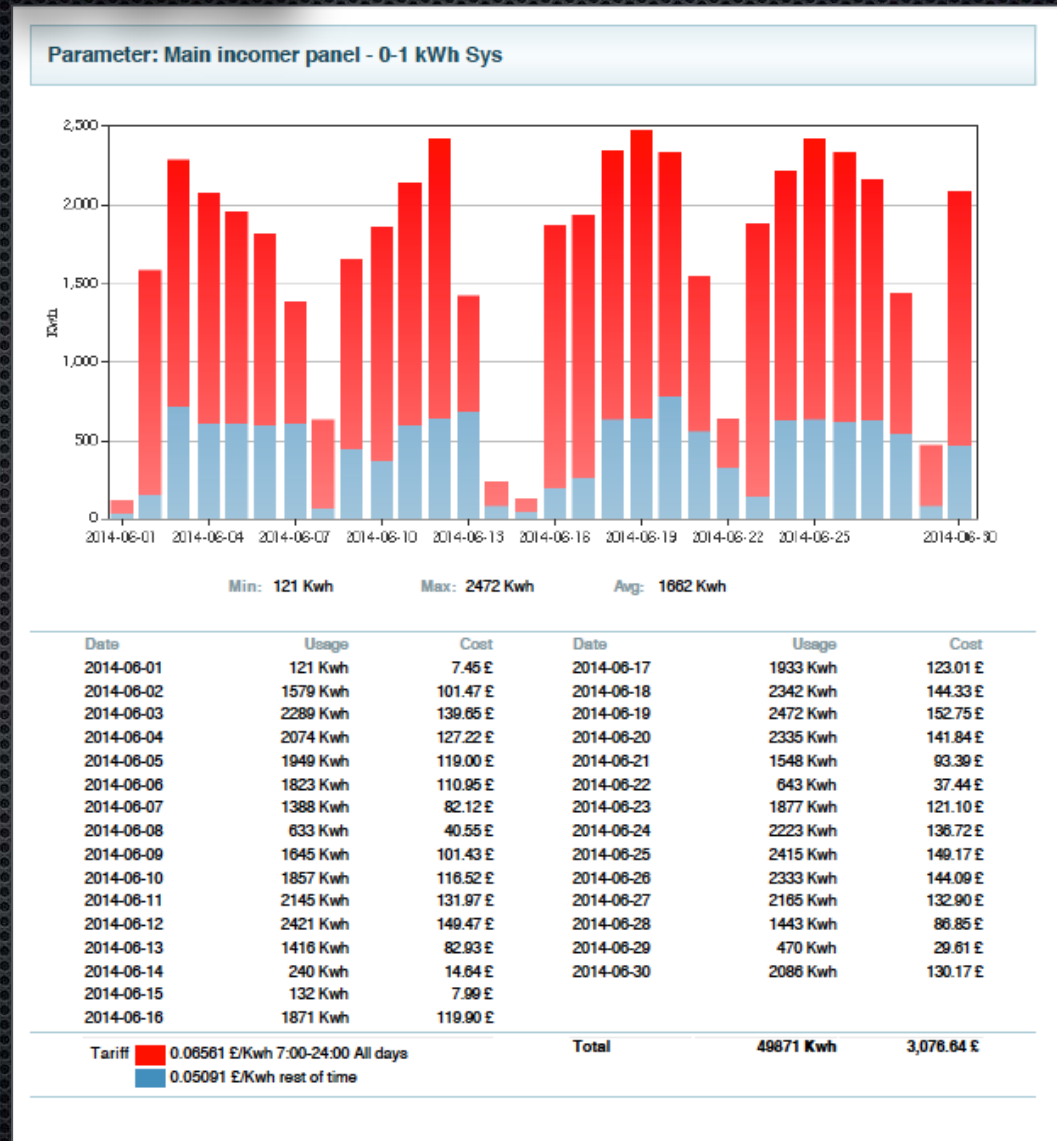
There should be no additional plant working on any night, yet the graphs clearly show the night time consumption on a Sunday is less than half every other night.

On this single circuit the savings will be circa £3,000 per annum.



# Analysing Data

Comparing data against production or business activity can help clarify actual consumption and cost.



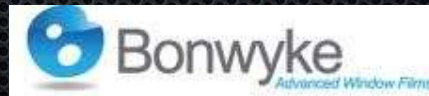
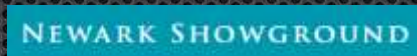
# HH Data - Your Free Information

Do you use your HH (Half Hourly) data from your energy provider?

Site.Meter	Date	00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30	04:00	04:30
PI Manchester.PI Manchester Gas AMR 106 (kWh)	01-Mar-12	66.64	99.96	55.54	66.64	88.86	33.32	44.43	99.96	55.54	44.43
PI Manchester.PI Manchester Gas AMR 106 (kWh)	02-Mar-12	66.81	77.95	55.68	66.81	100.22	33.41	44.54	89.08	55.68	55.68
PI Manchester.PI Manchester Gas AMR 106 (kWh)	03-Mar-12	123.11	134.31	67.15	44.77	89.54	44.77	89.54	55.96	78.35	
PI Manchester.PI Manchester Gas AMR 106 (kWh)	04-Mar-12	44.54	55.68	55.68	66.81	89.08	44.54	66.81	155.90	55.68	77.95
PI Manchester.PI Manchester Gas AMR 106 (kWh)	05-Mar-12	55.82	89.31	55.82	78.15	111.64	111.64	111.64	78.15	89.31	133.97
PI Manchester.PI Manchester Gas AMR 106 (kWh)	06-Mar-12	122.80	156.29	178.62	167.46	200.95	212.11	167.46	167.46	122.80	189.78
PI Manchester.PI Manchester Gas AMR 106 (kWh)	07-Mar-12	100.47	167.46	133.97	66.98	111.64	89.31	66.98	89.31	78.15	55.82
PI Manchester.PI Manchester Gas AMR 106 (kWh)	08-Mar-12	66.98	133.97	78.15	111.64	111.64	78.15	78.15	145.13	78.15	78.15
PI Manchester.PI Manchester Gas AMR 106 (kWh)	09-Mar-12	100.22	122.49	89.08	89.08	122.49	66.81	77.95	100.22	77.95	77.95
PI Manchester.PI Manchester Gas AMR 106 (kWh)	10-Mar-12	122.49	89.08	77.95	77.95	100.22	66.81	44.54	89.08	55.68	55.68
PI Manchester.PI Manchester Gas AMR 106 (kWh)	11-Mar-12	111.64	156.29	145.13	156.29	133.97	66.98	78.15	111.64	100.47	55.82
PI Manchester.PI Manchester Gas AMR 106 (kWh)	12-Mar-12	89.08	122.49	89.08	77.95	111.35	77.95	66.81	122.49	77.95	77.95
PI Manchester.PI Manchester Gas AMR 106 (kWh)	13-Mar-12	55.82	111.64	55.82	66.98	122.80	66.98	66.98	89.31	89.31	78.15
PI Manchester.PI Manchester Gas AMR 106 (kWh)	14-Mar-12	89.31	100.47	100.47	89.31	145.13	133.97	111.64	122.80	55.82	66.98
PI Manchester.PI Manchester Gas AMR 106 (kWh)	15-Mar-12	100.73	134.31	67.15	100.73	123.11	78.35	123.11	167.88	123.11	89.54
PI Manchester.PI Manchester Gas AMR 106 (kWh)	16-Mar-12	89.31	111.64	133.97	133.97	100.47	55.82	78.15	111.64	89.31	78.15
PI Manchester.PI Manchester Gas AMR 106 (kWh)	17-Mar-12	66.81	77.95	66.81	77.95	111.35	66.81	66.81	100.22	66.81	77.95
PI Manchester.PI Manchester Gas AMR 106 (kWh)	18-Mar-12	100.22	122.49	100.22	100.22	133.62	77.95	77.95	133.62	89.08	100.22
PI Manchester.PI Manchester Gas AMR 106 (kWh)	19-Mar-12	77.95	122.49	66.81	100.22	133.62	66.81	77.95	155.90	77.95	89.08
PI Manchester.PI Manchester Gas AMR 106 (kWh)	20-Mar-12	66.98	111.64	89.31	66.98	100.47	122.80	133.97	78.15	89.31	55.82
PI Manchester.PI Manchester Gas AMR 106 (kWh)	21-Mar-12	89.31	133.97	78.15	89.31	100.47	78.15	78.15	111.64	78.15	78.15
PI Manchester.PI Manchester Gas AMR 106 (kWh)	22-Mar-12	122.49	133.62	100.22	100.22	111.35	100.22	100.22	111.35	133.62	100.22
PI Manchester.PI Manchester Gas AMR 106 (kWh)	23-Mar-12	88.63	121.86	77.55	88.63	110.79	66.47	77.55	121.86	66.47	99.71
PI Manchester.PI Manchester Gas AMR 106 (kWh)	24-Mar-12	122.18	144.39	88.86	144.39	166.61	144.39	99.96	122.18	111.07	99.96
PI Manchester.PI Manchester Gas AMR 106 (kWh)	25-Mar-12	111.35	133.62	111.35	-	-	111.35	100.22	111.35	100.22	155.90
PI Manchester.PI Manchester Gas AMR 106 (kWh)	26-Mar-12	88.63	166.18	132.94	88.63	110.79	99.71	99.71	121.86	99.71	99.71
PI Manchester.PI Manchester Gas AMR 106 (kWh)	27-Mar-12	100.22	122.49	111.35	89.08	111.35	89.08	77.95	111.35	100.22	144.76
PI Manchester.PI Manchester Gas AMR 106 (kWh)	28-Mar-12	89.31	111.64	66.98	78.15	111.64	78.15	89.31	111.64	100.47	89.31
PI Manchester.PI Manchester Gas AMR 106 (kWh)	29-Mar-12	77.55	99.71	121.86	121.86	166.18	144.02	99.71	99.71	110.79	88.63
PI Manchester.PI Manchester Gas AMR 106 (kWh)	30-Mar-12	122.18	122.18	155.50	177.71	133.28	133.28	88.86	88.86	122.18	88.86
PI Manchester.PI Manchester Gas AMR 106 (kWh)	31-Mar-12	122.49	100.22	122.49	111.35	100.22	133.62	100.22	100.22	133.62	122.49
Min		44.54	55.68	55.54	-	-	33.32	44.43	78.15	55.54	44.43



# Some of our customers





# Our Partners



# Thank You

Tony Verrall

0845 88 90210 - 07931 701400

[tony@uniq-solutions.co.uk](mailto:tony@uniq-solutions.co.uk)



**Sustainable Business Breakfast**

**Energy Efficient  
Technologies**

# Sustainable Business Breakfast

Energy Efficient Technologies






By Fred Furner

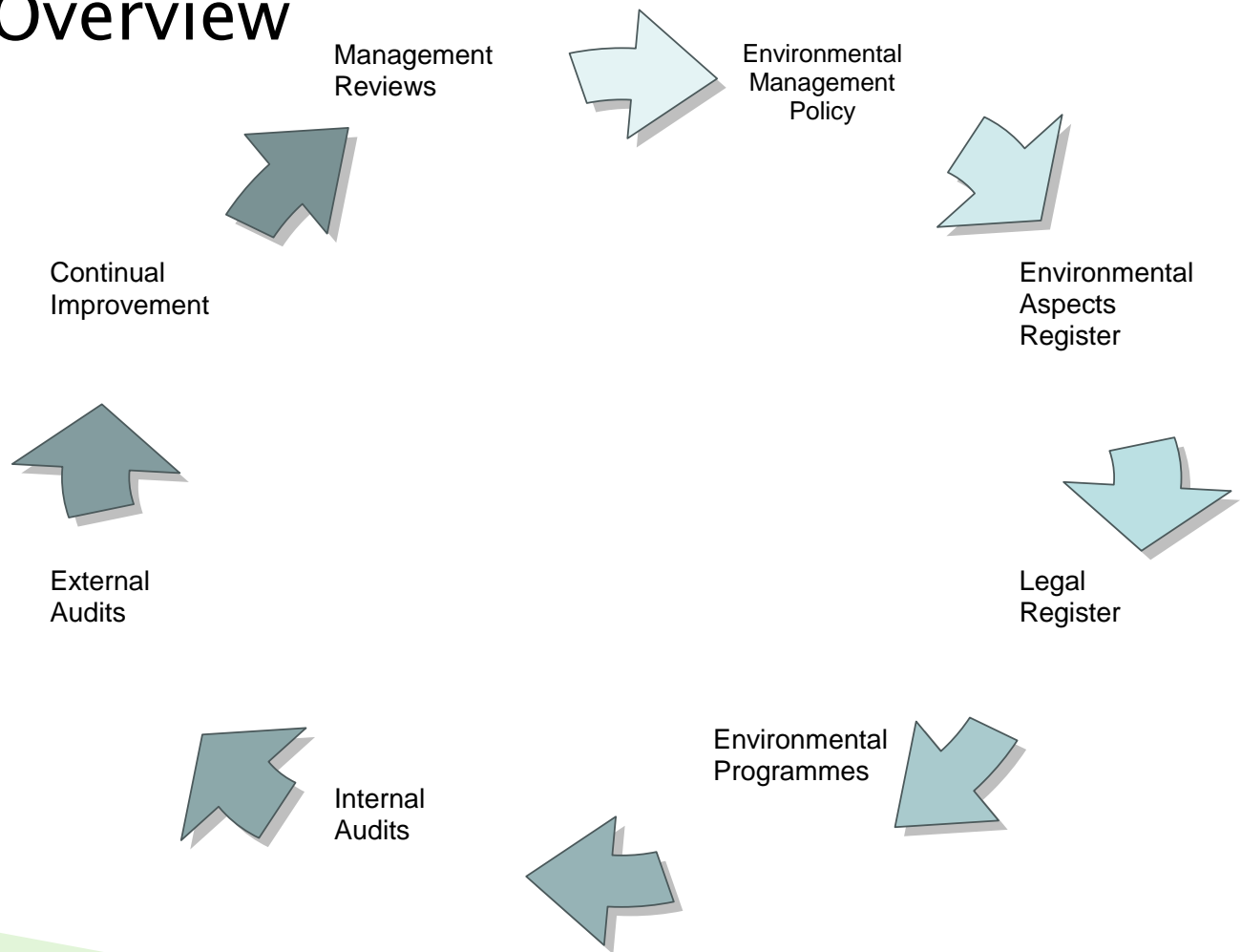
from Wave Leisure Trust

# Background

- ▶ Part of Lewes District Council until 2006
  - ▶ Formed Not for Profit Trust
  - ▶ Annual utility costs of £300k+
  - ▶ ISO 14001 accredited
- 

# ISO 14001 – Environmental Management System

## ► System Overview



# Photo Voltaic Panels

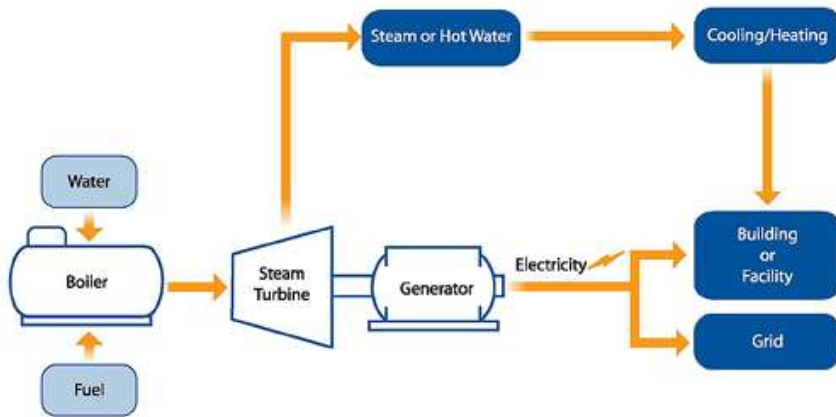


- ▶ 195 and 112 panels
- ▶ Produces 100,000 kWh's electricity per year
- ▶ Energy savings plus FIT
- ▶ Saves 60 tonnes CO<sub>2</sub>

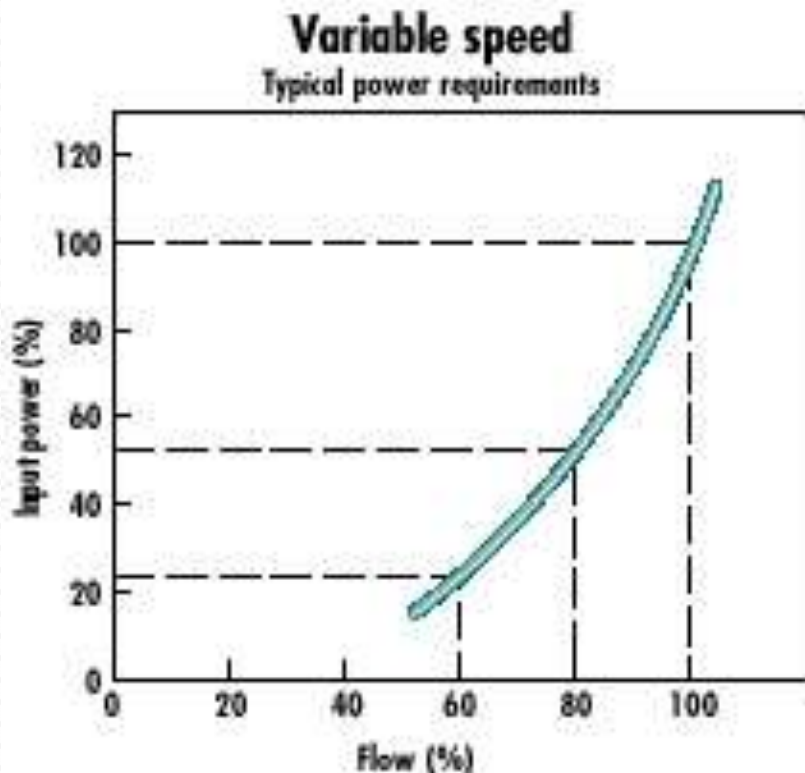


# Combined Heat and Power

- ▶ CHP for short!
- ▶ Expensive to install
- ▶ Efficiency 13%
- ▶ Electricity 3x cost of gas
- ▶ Electricity “dirty”
- ▶ Reduced CO<sub>2</sub> from 160 to 130 tonnes



# Variable Speed Drives



- ▶ Reduces power to AHU's and pumps
- ▶ 50Hz standard settings
- ▶ Logarithmic scales
- ▶ Different settings for day and night

# Low Energy Lighting

- ▶ Reduces cost of lighting
  - ▶ Reduces cost of replacing tubes
  - ▶ Reduces labour costs of maintaining tubes
- 

# Housekeeping




- ▶ What can you do on an everyday basis to lower your energy costs?



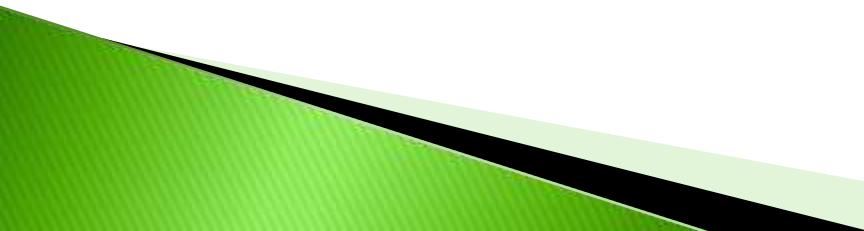
# Good Practice

## **At Wave Leisure we...**

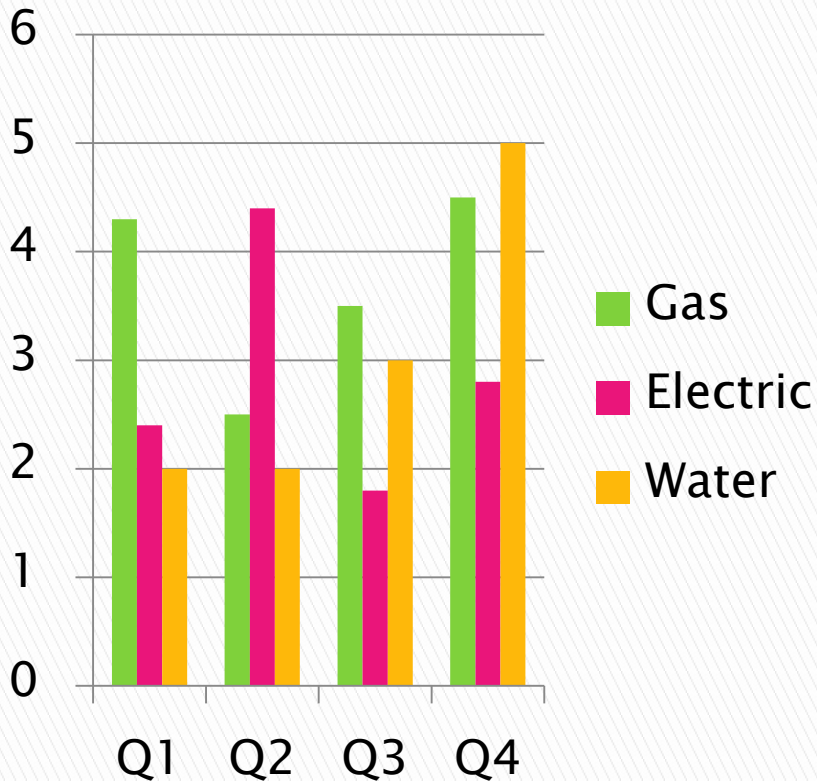
- ▶ Turn lights off when not in use
  - ▶ Use light sensors
  - ▶ Recycle what you can – make it easy
  - ▶ Use urinal sensors
  - ▶ Check pans for continual flushing
  - ▶ Check taps regularly
  - ▶ Are photo-copiers and printers set to black and white draft
- 

# Good Practice

**We ask our facilities managers to consider the following regarding the use of radiators and air conditioning:**

- ▶ What is the set point?
  - ▶ Do you understand the controls?
  - ▶ Are windows open with radiators on?
  - ▶ Do you have conflicting a/c and heating units?
  - ▶ Are units serviced regularly?
- 

# Measure Utility Usage



- ▶ Compare comparative months
- ▶ Look for trends
- ▶ Consider degree days
- ▶ Keep it simple
- ▶ Convert into kWh's





- ▶ Thank you for listening
- ▶ Do you have any questions?

# Round-the-Tables

**Business intros...**

# Green Growth PLATFORM



University of Brighton

**Unlocking** business potential

GreenGrowth  
**PLATFORM**



**University of Brighton**

# 4 SERVICE AREAS

**1-2-1 BUSINESS SUPPORT**

**BUSINESS EVENTS AND  
OPPORTUNITIES**

**INNOVATION, RESEARCH AND  
DEVELOPMENT**

**SKILLS AND TRAINING**

**[www.greengrowthplatform.co.uk](http://www.greengrowthplatform.co.uk)**

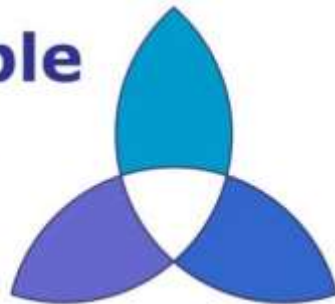
# Join us again...

**Chichester, 17<sup>th</sup> July**

Electric vehicles and renewable energy

[www.sustainablebusiness.org.uk](http://www.sustainablebusiness.org.uk)

**Sustainable  
Business  
Network**



Working in partnership with:

Green**Growth**  
**PLATFORM**



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