



Energy Management Making a Difference

A facilities management perspective

City College Plymouth
Gilbert Snook
Head of Estates

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Introduction

- Overview
 - ❖ Gilbert Snook
 - ❖ Brita in Pubs demonstration project
 - ❖ Facilities management in practice



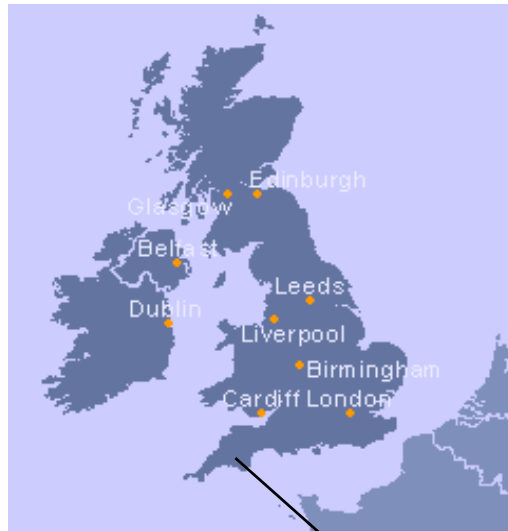
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Introduction

- City College Plymouth

location map



Plymouth

view to south west



College Premises

- 40000m₂ gross internal area
- 2 main sites



Kings Road campus



Goschen Centre campus

- 4 small annexes

College turnover

During the academic year ending July 2006

- 6000 full time equivalent students
- 630 full time equivalent staff
- College turnover €43 million



College utilities

Utility Comparison

Site	Utility	2001/02	2006/07	% Change
KR	Electricity	2,085,371 kwh	1,973,334 kwh	-5.37%
KR	Fossil Fuel	3,650,419 kwh	2,820,457 kwh	-22.7%
KR	Water	7,423 m ³	7,710 m ³	+3.9%
GC	Electricity	717,668 kwh	690,336 kwh	-3.8%
GC	Gas	1,034,979 kwh	839,141 kwh	-18.92%
GC	Water	3,431 m ³	2,875 m ³	-16.2%



Notes:

1. Water data for Kings Road 2001/02 may be slightly inaccurate. The true consumption was likely to be higher.
2. Water consumption at Kings Road before 2001/02 was typically in excess of 11,000 m³ p.a. The reduction after this time was due to the introduction of waterless urinals.

Lessons Learnt

The lessons we have learnt over the last 10 years can be divided into four headings:-

- **The right people**
- **The right policies**
- **The right control systems**
- **The right approach to capital projects**



The right people

- Services engineer
- Energy consultants
- Estates team
- Staff involvement



Martin Sings, Estates services engineer

The right policies

- Energy audit
- Energy Policy
- Utilities tendering
- Bill monitoring
- Regular reporting
- Continuing professional development



The right policies

- **Energy audits**
- Waterless urinal
 - Conversion of existing urinal
 - New trap
 - Chemical stick
 - Specific cleaning routine



Waterless urinal

The right policies



City College Plymouth Towards continuous quality improvement

Energy Strategy 2007

This strategy is an integral part of the college Environmental / Sustainability Policy March 2007

- **Statement of Intent**
- **To review and report on the college's use of energy and express progress both in terms of energy used and CO2 emitted**
- **To co-operate and participate enthusiastically in Public Sector initiatives and targets whether coming from Central Government, Local Government or the LSC**
- **Since 2002 the college has reduced overall energy consumption by 10% per square metre. Therefore the college commits to save a further 10% reduction in overall energy use by August 2010**
- **The college needs to become much more informed about reporting on CO2 production and publish a reduction target in the short term at least by August 2008**
- **The college reduced its water consumption by about a third through the introduction of waterless urinals. The college commits itself to achieve a further 10% saving per square metre by August 2010**
- **The college commits to invest at least £10,000 pa in specific energy and water saving measures and technologies**
- **To produce an action plan on an annual basis for each new academic year**

The right policies

- **Utilities tendering**
 - Intelligent consumption budgeting and targets
- **Bill monitoring**
 - Identification of errors and excessive consumption
 - Meter monitoring
- **Regular Reporting**
 - Performance against budget
 - Benchmarking
- **Continuing professional development**



The right control systems

- Satchwell 2800+
- Satchwell SMART Report
- Satchwell Utilities Monitoring



The right control systems

Satchwell 2800 +

The screenshot displays the Satchwell BAS2800+ System Manager interface. The main window is titled "Satchwell BAS2800+ System Manager - Satchwell System Manager". It features a menu bar (File, Options, Display, Group List, Access, Window) and a toolbar with various icons. The central area is divided into two panes:

- Display Pane:** Shows a list of display mnemonics and their corresponding data. The data includes temperature readings and status indicators.
- Plant Index Pane:** Shows a hierarchical tree structure of the building's plant components.

Display Mnemonics Data:

Display Mnemonic	Value	Status
CRI-COM-AVT	Temp 10.4°C	MEAN
CGY-GRD_DRA_SAT	Temp 17.3°C	AUTO
CGY-GRD_DRA_RMT	Temp 21.7°C	AUTO
CGY-GRD_DRA_SAT	Temp 17.3°C	AUTO
CGY-GRD_DRA_RMT	Temp 21.7°C	AUTO
CGY-GRD_DRA_SAT	Temp 17.3°C	AUTO
CGY-GRD_DRA_RMT	Temp 21.8°C	AUTO
CGY-GRD_DRA_SAT	Temp 17.4°C	AUTO

Plant Index Tree Structure:

- PLYMOUTH COLLEGES FE
 - CFE. KING ROAD
 - CFE. GOSCHEN YARD
 - BOILER ROOM
 - A BLOCK
 - GROUND FLOOR
 - DANCE STUDIO
 - CHANGING ROOMS
 - NURSERY
 - DRAMA RM
 - PERFORMING ARTS
 - CBCC
 - EPL OFFICES
 - C BLOCK
 - FIRST FLOOR PUMP RM

Point Index List:

- RECOP DAMPER CT
- RECOP BYPASS DA
- CT PUMP ENABLE
- CT PUMPS ROTATIO
- CT PUMP 1 CHD
- CT PUMP 1 STATUS
- CT PUMP 2 CHD
- CT PUMP 2 STATUS
- PUMP FAIL A/CHAN
- PLANT OPTIMISER
- SMART OVERRIDE P

The bottom status bar shows: Mnemonic: CGY-GRD_DRA_SAT, Osn No: 126, Pnt No: 10, Pnt Type: AI.

The right control systems

- Satchwell Smart Reports



TAC / Satchwell

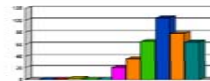
Central Support Facility

CONTROL LOOP INFORMATION

The performance of a control loop is defined as how successful it can maintain a Primary input value to that specified by a Setpoint. This table contains information as to how near or far the Primary value was away from the Setpoint when a test was performed.
 Note: Please keep the control-parameters in mind (P - PI - PID) when analysing the data

The Control Loop Indicator is a percentage of how often the primary input value hit setpoint.

<75% loop investigation required
 >=75% and <85% satisfactory loop performance
 >=85% and <95% good loop performance
 >=95% excellent loop performance

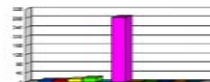


Loop Performance [%] Tests Successful
 5 369

loop investigation required

PLYMOUTH COLLEGES FE CFE, GOSCHEN
 YARD A BLOCK CANTEN/KITCHEN AHU
 Room Control Point

Tests Failed	Tests Inhibited	Loop Usage [%]	Scale Factor
0	1,106	25	1.0



Loop Performance [%] Tests Successful
 85 333

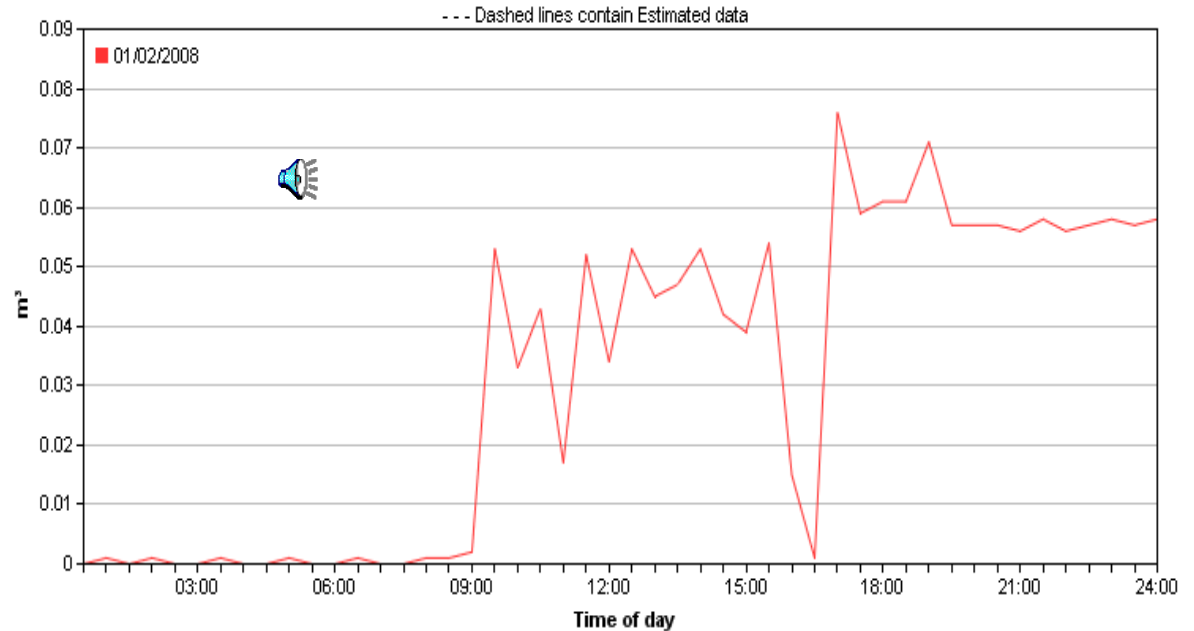
good loop performance

PLYMOUTH COLLEGES FE CFE, GOSCHEN
 YARD BOILER ROOM BOILERS CONTROL
 BOILER CONTROL POINT

Tests Failed	Tests Inhibited	Loop Usage [%]	Scale Factor
0	1,083	23	5.0

The right control systems

- Satchwell Utilities Monitoring



The right approach to capital projects

- Design team involvement
- Commissioning
- Training and Maintenance manuals
- BREEAM



The right approach to Capital Projects

- Design team involvement



The right approach to Capital Projects

Commissioning



The right approach to Capital Projects

- Training and maintenance manuals



The right approach to capital projects

- **BREEAM - Building Research Establishment Environmental Assessment Method**
 - Development management
 - Energy use
 - Health and well being
 - Pollution
 - Transport
 - Land use
 - Ecology
 - Materials
 - Water



Wind Turbines

- BRITA report
- Performance with 2x6kW turbines
 - Actual output 6500 kWh/pa
 - Original output 33800 kWh/pa
- Cost
 - €96500
- Lessons Learnt
 - Wind gusting
 - Shadow flicker
 - Vibration
 - Noise



Conclusions

- **Systematic approach**
- **Invest to save**
 - **The right people**
 - **The right policies**
 - **The right control systems**
 - **The right approach to capital projects**
 - **technologies**
- **Action planning from Training**
- **Any questions**
- **Contact details**
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