e3 Bureau

- UCD, DIT, TCD, DCU
- Bureau Service Provider
- SEAI Support
- Common Approach
- Set Targets

- [WWW.e3.ie](http://WWW.e3.ie)
e3 Bureau – Ph1

- 3 year programme, commencing 2004
- 30 buildings
- Target of 10% reduction in Primary Energy
- WWW.e3.ie
e3 Organisational Structure
e3 Activities
Electricity Usage

![15 Day Profile Chart]

<table>
<thead>
<tr>
<th></th>
<th>Tue, 29 Nov-11</th>
<th>Wed, 30 Nov-11</th>
<th>Thu, 01 Dec-11</th>
<th>Fri, 02 Dec-11</th>
<th>Sat, 03 Dec-11</th>
<th>Sun, 04 Dec-11</th>
<th>Mon, 05 Dec-11</th>
<th>Tue, 06 Dec-11</th>
<th>Wed, 07 Dec-11</th>
<th>Thu, 08 Dec-11</th>
<th>Fri, 09 Dec-11</th>
<th>Sat, 10 Dec-11</th>
<th>Sun, 11 Dec-11</th>
<th>Mon, 12 Dec-11</th>
<th>Tue, 13 Dec-11</th>
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</thead>
<tbody>
<tr>
<td>Night Units</td>
<td>2139.65</td>
<td>2166.56</td>
<td>2160.24</td>
<td>2120.07</td>
<td>2012.72</td>
<td>2031.2</td>
<td>2083.53</td>
<td>2144.47</td>
<td>2137.18</td>
<td>2002.22</td>
<td>2144.57</td>
<td>2068.79</td>
<td>2082.32</td>
<td>2114.81</td>
<td>2176.12</td>
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<tr>
<td>Day Units</td>
<td>4798.03</td>
<td>4792.28</td>
<td>4792.38</td>
<td>4521.70</td>
<td>3588.56</td>
<td>3481.07</td>
<td>4653.15</td>
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<td>4574.75</td>
<td>4457.44</td>
<td>4323.42</td>
<td>3660.58</td>
<td>3595.53</td>
<td>4643.57</td>
<td>4770.72</td>
</tr>
</tbody>
</table>
Daily Load Profile
Mechanical Plant Electricity Usage
Mech Plant Electricity Profile
Breakdown of Electricity Usage

Fig 4 - CSCB building Electrical Usage

- Fume Cupboards: 69%
- Lighting: 7%
- AHUs: 7%
- Compressed Air: 5%
- PCs: 3%
- Drying Ovens: 2%
- Ground Floor labs: 2%
- Balance: 5%
e3 Bureau Phase 2

- 62 Buildings (11 UCD)

- 10% target for Ph 2 Buildings

- Maintain Performance in Ph 1 Buildings
e3 Ph 1 Results

- 12% energy saving
- Savings > €360,000
- 1490 tonnes CO2
e3 Ph 2 Results

- Overall Saving €4.25m
- CO2 saving 16600 tonnes
Main factors affecting energy use:
- Introduction of perimeter radiators which allowed AHU fans to operate at lower speeds, now CO2 controlled
- Improved BMS control of lighting.
- Occupancy control of lighting in concourse
- Daylight linking of 4th floor atrium lights
- Automatic powerdown of some student PCs
- Changes to entrance arrangement to reduce draft from Arts link bridge
- Replacement of many failed valves and actuators
Main factors affecting energy use:
- Replacement of cooling tower and pumps with smaller system
- Replaced server room chiller with small a/c units
- New air compressor, and improved operation and control of compressed air system
- Weather compensation of boiler mixed flow temperature
- Summer mode heating switchoff
- Draft lobby at rear pedestrian entrance and new goods entrance door with pedestrian access
- New light fittings on lower ground floor corridors
Main factors affecting energy use:

- Lecture theatre occupancy sensor control of lights and ventilation
- Daylight linking in concourse.
- New AHU theatre B
- Upgrade AHU theatre C
- The student canteen was replaced with Elements in summer 2006
Case Study

e3 Energy Management Bureau

INTRODUCTION

Four Dublin-based colleges, Dublin Institute of Technology (DIT), Trinity College Dublin (TCD), Dublin City University (DCU), and University College Dublin (UCD), joined together to form an energy management bureau e3 (Energy – Environment – Economy).

An Energy Management Bureau:

- analyses energy consumption
- identifies opportunities for savings
- implements change

Project Background

The e3 project was part-funded by Sustainable Energy Ireland, to facilitate the Bureau service and the upgrade of the existing energy monitoring systems.

At the outset, e3 identified two necessary components of the project:

- implementation of an Energy Monitoring and Targeting (M&T) system
- appointment of a Bureau Service Provider (BSP) to provide organisation and technical expertise

The Energy M&T system was required to track the electricity and gas usage of each building. A monitoring system had already been...
Top 10 Total Electricity

70% of Belfield Total
-2.1% compared to same month last year
+2.0% year to date compared to last year
e3 Energy Management Bureau
Building Energy Report
UCD MBRS
January 2011

Electricity

Monthly Electricity Use

Year to Date

Day & Night Electricity Use

Gas

Monthly Gas Use

Year to Date

Actual Gas Use vs Predicted Gas Use
(predictions based on analysis of 2008/09 heating season)

Electricity use year to date has changed by 8.6% relative to target.
Electricity use this month has changed by -10.5% relative to same month in baseline year.
Total cost of electricity this month €2,779.
Electricity cost year to date has changed by -31% relative to baseline year.

Logging commenced Jun 08 - assume Jan 08 - May 08 equal to 2009 monthly totals.
Baseline year is 2009. Target is 10% reduction in primary fossil fuel energy.

Gas use year to date has changed by +35.0% relative to target.
Gas use last month has changed by +21.5% relative to same month in baseline year.
Total cost of gas this month €1,881.
Gas cost year to date has changed by 33% relative to baseline year.
Gas use over the past 4 weeks was 21.3% above the predicted gas use.

Baseline year is 2009. Target is 10% reduction in primary fossil fuel energy.
Communicating the message:

Training & Awareness

- Posters
- Switch off stickers
- Calling post-its
- Focus group presentations
- SEI Events
- Website  www.e3.ie
Phase 3

- Whole Campus Approach
- Planning for 2020 Public Sector Targets
- Focus on new building design
Thank You!
Commit

Step 1: Senior management commitment
Step 2: Appoint senior manager to Energy MAP
Step 3: Appoint Energy MAP coordinator
Step 4: Establish an Energy MAP team
Step 5: Establish an Energy MAP Policy
- **Identify**
  - Step 6: Develop and overview total energy consumption
  - Step 7: Survey energy use & identify significant energy users
  - Step 8: Identify key factors that influence energy consumption & Energy Performance Indicators
  - Step 9: Identify energy saving opportunities
• **Plan**
  Step 10: Set objectives and targets
  Step 11: Establish Programme Plan
  Step 12: Formally allocate sufficient human, financial & systems resources
Take Action
Step 13: Implement the Programme Plan
Step 14: Promote energy efficiency awareness and practices amongst employees
Step 15: Train key personnel in energy efficient practices
Step 16: Operate, maintain, purchase & design significant energy users efficiently
Review
Step 17: Continuously measure & monitor energy performance & check against targets
Step 18: Identify & implement corrective and preventative actions
Step 19: Periodically review Energy MAP and identify improvements
Step 20: Management Review of Energy Map