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Economic Case for Early Adoption of Facilities Management - Presentation

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The Economic Case for Early Adoption of Facilities Management

By

Barry McAuley MSc, BSc (H), Dip.Eng
Dr. Alan V. Hore
Dr Roger West
Dr John Wall
THE IRISH ECONOMY

- €38.4 billion in 2007 / €10.5 billion by the end of 2011
- €300 million a year through simple actions - SEI
- State contracts worth up to €16 billion a year – Irish Government
- Reduce greenhouse gas emissions by up to 20% by the year 2020 – EU
- Traditional method of construction needs to be re-engineered
Mixed Methodology

- Case Study
- Interviews
- Questionnaire
CASE STUDY

- Opened in 2007 and was constructed for an initial €60 million
- Financial plan proposed saving initiatives in the region of €1.2 million over three years
- Better Energy Management Plan totaling €182,000 that generated savings of up to €360,363 over the three year period
- Interviews with Current Facilities Management Team and former Construction Management Team
# BETTER ENERGY MANAGEMENT PLAN

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Initial Cost</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The changing of all current lights in the downstairs car park to PIRS. This will result in a microwave signal being emitted and in turn will optimize the efficiency of the lighting, as it will only be used on a needs basis.</td>
<td>€9,141</td>
<td>€27,215</td>
</tr>
<tr>
<td>2</td>
<td>Replace all 50watt A.R. 11type lamps with 35Watt energy efficient type.</td>
<td>€6,873</td>
<td>€10,039</td>
</tr>
<tr>
<td>3</td>
<td>Replacement of 120 x 35 Watt capsule halogen downlighter fittings in Consultant suites and throughout the building to 2 Watt LED downlight with equal Lux level performance.</td>
<td>€8,591</td>
<td>€10,479</td>
</tr>
<tr>
<td>4</td>
<td>Modification of all corridor and back house light fittings to incorporate 2 tube electronic start T5 tubes in place of 4 tube T8 type. This will reduce the power consumption by approximately 50% and increase the lifespan of the fittings and components by approximately 50%.</td>
<td>€13,233</td>
<td>€41,454</td>
</tr>
<tr>
<td>5</td>
<td>Installing key switches throughout the building that will prevent the staff and patients from leaving unnecessary lights on. This will enable reduction of electrical waste.</td>
<td>€7,900</td>
<td>€31,971</td>
</tr>
<tr>
<td>6</td>
<td>Reconfiguration of the boiler plant to incorporate a combined Heat and Power system. The proposed installation of a CHP system will eliminate the three boilers which have no connection between the domestic hot water calorifiers and the main headers, resulting in significant savings in gas.</td>
<td>€32,905</td>
<td>€47,916</td>
</tr>
<tr>
<td>7</td>
<td>Installation of two port valves on the existing LTHW and their associating controllers. This will prevent boilers becoming heat sinks.</td>
<td>€10,590</td>
<td>€29,040</td>
</tr>
<tr>
<td>8</td>
<td>Updating the microprocessors in the BMS to encompass a complete re-programming of the existing BMS and include every item of plant in the facility. Also the installation of additional BMS control instruments and the associated I/O cards and programming. This will allow closer control and interaction between the user and the system on the Plant and Equipment set points.</td>
<td>€29,755</td>
<td>€57,692</td>
</tr>
<tr>
<td>9</td>
<td>Design and installation of a new control system for the compressors that will create an “on demand” scenario ensuring the compressors only operate when needed.</td>
<td>€16,790</td>
<td>€15,700</td>
</tr>
<tr>
<td>10</td>
<td>Advanced training on critical equipment i.e. BMS, Medical Equipment, wheel chairs.</td>
<td>€14,500</td>
<td>€24,100</td>
</tr>
<tr>
<td>11</td>
<td>Medical Air Compressor re-design and re-build.</td>
<td>€16,790</td>
<td>€15,700</td>
</tr>
</tbody>
</table>

## Installation / Cost Breakdown

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultancy Design</td>
<td>€100</td>
</tr>
<tr>
<td>Ballast Change 320 fittings</td>
<td>€6,001.60</td>
</tr>
<tr>
<td>Electronics starters for each fitting 320 x €1.90</td>
<td>€577</td>
</tr>
<tr>
<td>Removal of WEEE disposal of existing ballast 320 x €2.50</td>
<td>€800</td>
</tr>
<tr>
<td>Purchase new T5 Tubes 640 x €3.59</td>
<td>€2,597.60</td>
</tr>
<tr>
<td>Replace T8 Lamp holders with T5 Lamp Holders (duals x 320 fittings) = 1280 x €1.90</td>
<td>€254.20</td>
</tr>
<tr>
<td>Testing and Commissioning</td>
<td>€50</td>
</tr>
<tr>
<td>Total Installation Costs</td>
<td>€13,233</td>
</tr>
</tbody>
</table>

### Savings Breakdown

**a**

- **Original cost to power T4 tube to T8 Modular tubing (Get out Below)**
  - 320 fittings x 122 watts (4 x 28w tubes) = 38.84 kw
  - 38.84 kw / 12 hours in a day = 3.28 kw / 12 hours in a day = 2.66 kw / 0.17 hour per day
  - Cost year 1 = 73.10 x 182 (days) = €3,304.20
  - Cost year 2 = 73.10 x 365 (days) = €22,587.90
  - Cost year 3 = 73.10 x 365 (days) = €22,587.90
  - Total original cost over 2.5 years = €58,480

- **Modified to T5 Electronic Fittings to reduce power consumption to 32 Watts per fitting resulting in a net saving in approx 50% of running costs**
  - Savings year 1 = €6,652.10
  - Savings year 2 = €13,340.20
  - Savings year 3 = €13,340.20

- **New approximate cost saving on power over 2.5 years** = €33,332

**b**

- **Savings on re-lamping in 50% approx per annum**
  - Original Cost 320 x 4 = 1,280 lamps per year @ 3.20 each = €4,096
  - Lamps Year 1 = €2,048
  - Lamps Year 2 = €4,096
  - Lamps Year 3 = €4,096
  - New Cost year 1 = €1,024
  - New Cost year 2 = €2,048
  - New Cost year 3 = €2,048

- **New Calculated savings on lamp changes over 2.5 years** = €5,120

**c**

- **New installed ballast fittings will reduce the placement rate over the next 2.5 year period**
  - Estimated 60% of ballast fittings = 128 new ballasts @ 15.62 per unit = €1,999.36
  - Total ballast replacement cost = 320 ballasts @ 15.62 per unit = €5,001
  - Hence total saved on ballast expenditure over 2.5 years = €5,001 - €1,999.36 = €3,001.64

- **New calculated savings on ballast changes over 2.5 years** = €3,001.64

- **New savings benefits achieved from modification of fittings** = €41,645.54
Case Study Results

- Poor design choices and inadequate planning

- Energy Management Scheme could have been realised during construction

- Early collaboration between the Facilities Manager and the design team, would have been reduced life cycle costs.

- The practical approach by the Facilities Manager, could have helped to avoid counterproductive design details

- Facilities Manager suffering from a managerial identify crisis having been confined to the lower levels of Management
QUESTIONNAIRE

- Online Survey through Survey Monkey

- Target Audience
  - Facility Managers
  - Project Managers
  - Architects

- 5 Different Sections
  - Life Cycle Cost
  - Best Environmental Practice
  - A More Innovative Approach
  - Role in the Construction Process
  - Business Function

- A total of 51 Replies
QUESTIONNAIRE RESULTS

- All of the respondents agreed in some form that the Facility Manager should be introduced into the construction management stage at an early level.

- 98% agreement the Facilities Manager if introduced at the design and construction stage can help highlight best environmental practices.

- 92% agreed that a better approach would be the partnering of the Project and Facilities Manager along with the Design Team.

- Facilities Manager would best serve if they were integrated into the design stage in a consultant role.

- 86% of the respondents believed that irrespective of its potential as a business strategy, it was still not considered an actual profession.
MIXED METHODOLOGY RESULTS

- Early collaboration between the Facilities Manager and the design team would have resulted in reduced life cycle costs.

- Adopt a more practical approach in avoiding counterproductive designs in favour of a more passive building.

- Innovative approach of partnering the Project and Facilities Manager along with the Design Team throughout the Construction Stage.

- A vital experience to external visitors and was central to the clinics business goals.

- Facilities Departments are still only viewed at an operational level and is still not considered an actual profession.
CONCLUSION

- Facilities Manager, if introduced into the beginning of a structures lifecycle, has the potential to increase sustainability and in the process promote best construction practice.

- Operational needs of the client are addressed at the onset of construction.

- Continue to play the silent partner, unless it begins to promote itself as the key business strategy.

- FM process begins to move towards creating interactive capabilities, in order, to portray its financial worth to an organisation.
QUESTIONS