SEAI Public Sector Programme
ICT energy usage in the Public Sector

CA ESD Cyprus Meeting, 23rd – 24th October 2012

Alan Ryan, Public Sector Programme Manager, Sustainable Energy Authority of Ireland
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The public sector – 2010 data

- €700m+ energy spend
- Two targets
  - Top down - 33% organisational energy efficiency improvement
  - Bottom up - Avoided energy usage savings
    - 1500 GWh by 2016
    - 3240 GWh by 2020
To come

NEEAP 2

Energy Services Directive

- 3% retrofit target per year for ‘central government’

- > 500m² from January 2013, SI 243 of 2012

Policy and legal obligations

- Better procurement of energy supplies, energy efficiency and renewable energy services, energy using products and energy using capital projects

- Display Energy Certificates required in public buildings ≤1,000m²

- Exemplar retrofit of Government buildings

- Lead by example

- 33% energy efficiency improvement by 2020

- 1,500 GWh savings

- Simplify Energy End-Use Efficiency and Energy Services
SEAI supports

- Top 150 PBs focus
- 30 signed up
- Energy Management
- Networking ‘EnergyLink’
- Guides Assessments Studies
- Organisation Performance
- Project / facility Performance
- Measuring ‘Performance’
- Funding = Grants
- Financing = ESCOs
- GPP Triple E Training

Commitment

PARTNERSHIP AGREEMENTS

1 2

BEST PRACTICE

3 4

MONITORING AND REPORTING

FUNDING, FINANCING AND PROCUREMENT
ICT

• Public Sector Experience 2009 - 2012
Public Sector Programme ‘Best Practice’ supports

- 2010 - 2011 ICT Working Group
- 27 public bodies participated

Objectives

- Determine the current status of ICT energy efficiency in the public sector;
- Identify and evaluate the key challenges and opportunities in the area;
- Review best practice in the field;
- Identify recommendations for improving energy performance in the delivery of energy effective ICT services among the participant organisations and across the entire sector – in compliance with NEEAP targets;
- Establish an ongoing ICT Energy Network within the Public Sector, to sustain efficiency gains to 2020.
ICT Working group outputs

- Working group report
- Guides produced
  - Desktop Power Management
  - Server Room Energy Efficiency
  - Case studies
- 27 Assessments in participating members ICT
- Networking forum
- Participants saved 5-70%
- National potential 30-70% possible
The challenges

- **Poor data** on the extent of ICT services infrastructure and on its energy performance;
- Deficiencies in the **design and operation of server rooms** and data centres;
- Limited management or operational focus on energy performance – **low priority**
- Limited knowledge of the energy efficiency **functionality of existing** software tools;
- **Perceived resistance** among ICT service end users to energy efficiency initiatives, e.g. desktop power management;
- Variable **competency** levels and limited knowledge sharing among ICT services personnel with respect to energy efficiency
Other ICT related services

- Public sector Advice Mentoring and Assessment service (AMA)
- Eligible retrofit technology under grant programmes
- Triple E – list of products that meet efficiency criteria
- Partnerships with public bodies
  - Stakeholders
  - Energy users
Stakeholders in energy efficient and effective ICT services

New national Public Procurement unit

**Policy, Funding & Compliance**
CMOD | DoF | LGSB | SEAI | EPA

**Design, Procure, Operate & Maintain**
Designers | Suppliers | Contractors | Consultants | CMOD Framework Agreements

**Competence Building**
CMOD | Professional Bodies

**End Users**
Public bodies & their customers
ICT equipment

- Fastest growing energy user
- Consumes up to 25% of office electricity
- Up to 15-20% for servers alone in certain public buildings
- Expected to rise to 30% by 2020
- Greatly affects a building's Display Energy Certificate

- 200W PC & Monitor
  - costs € 130 / year
  - On 12 hours a day
  - Emitting 328kg CO$_2$ at the power station
  - 10 x PC’s CO2 = 1 car
- PC & Monitor = 80W

- PC emits 98kg CO$_2$ at power station
  - More than 50% reduction

- Wooden recyclable PC’s help reduce product footprint
Changing fast – 2012 figures

- Survey of 3,441 PC’s:
  - 9 hour day
  - 30% left on when not needed
    (67,203 kWh per annum)
  - By far the largest user
- High degree of night usage
- Uncontrolled, not metered
- ‘Core energy server’ = server

V. building services
Networking

- Survey showed majority controlled server rooms at 18degC
- Consensus was 23degC
  - Temperature sensor on the front of the rack
  - Cool air to the front, hot exhaust back to a/c
  - No air conditioning!
- Hosted a ‘meet the supplier’ day
  - All indicated equipment could tolerate 30degC+
  - All interested in energy efficiency of services
Case studies

• Defence forces assessment
  – 70% reduction in server room consumption

• Grant
  – Virtualisation technologies – 80% in a local authority

• Many grant aided projects and buyers of Triple E procured equipment were working group participants
- Virtualisation, MS 2007 (30% operation saving), MS System Software Configuration Manager (SSCM)
Sector initiative in conjunction with Department of Education and Skills and National Centre for Technology in Education

IT EQUIPMENT

As efforts are made to reduce energy use in schools, there is one area in which energy use is increasing, namely Information Technology (IT) equipment. With the assistance of funding schemes, schools are purchasing computers and interactive whiteboards (IWIs), creating a demand for electricity that did not exist a few years ago. It is essential to manage and make efforts to control this increasing demand, as it could negate any savings made in other areas, such as lighting. Fortunately, many of the measures that can be taken involve little or no cost.

A lot of screens and digital projectors are in use in schools which can influence use of daylight and electric lighting. Choose quality interactive whiteboards and projectors which are appropriate for schools. This will enable daylight to continue to be used for more of the time in classrooms. For guidance on purchasing interactive whiteboards and digital projectors school should check the advice on the NCTE website. Specifically they should refer to the Digital Projector Procurement Framework.

Did you know?

Screen savers

Screen savers were designed to save the older CRT monitors from damage. They do not save energy and can actually reduce the life of a flat panel monitor by keeping the backlighting on unnecessarily.

Brightness

A monitor with a high brightness setting uses more energy. Reducing the brightness by 25% may not even be noticeable but would save energy, provided it does not result in blinding when pulsed lights being switched on more often.

Standby mode

A computer still uses some energy in Standby mode but...
Top Tips

• **Use existing software tools** to optimise energy use
  – No need to purchase new software – it's built in!
  – Do invest in consultant / skills to set up correctly, or up skill in house resources

• **Consider cloud computing** options
  – Move datacentre off-site = improved DEC

• **Increase data centre/comms room temp**
  – From 16-18degC to 23degC, see ASHRAE Guidance
A simple strategy

ICT Energy Savings in SEAI Public Sector Programme

SEAI EnergyMAP
• Management Commitment
• Structured Approach
• Low & no–cost actions
• Behaviour & attitudes
• Green Public Procurement

ICT Services
• Server virtualisation
• Desktop Power Management
• Cooled air management

RETROFIT
Of energy efficient equipment to existing sites and systems

Energy Efficient Design

33% NEEAP Target

3-10% savings in first year > 10-20% savings for specific projects > Average 3% per year to 2020 >>

2011 > 2013 > 2015 > 2020 >
### Table 2: Typical Energy Saving Opportunities – Desktop Environment

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Typical Energy Saving</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement desktop power management – either locally or via central script/policy</td>
<td>Up to 70% of desktop PC &amp; screen consumption</td>
<td>Savings based on auto shut down after 9 hour day / 5 day week</td>
</tr>
<tr>
<td>Replace desktop PCs with thin client terminals</td>
<td>Up to 70% of desktop PC consumption</td>
<td>Virtual desktop infrastructure (VDI) required to support thin clients/terminals.</td>
</tr>
</tbody>
</table>

### Table 3: Typical Energy Saving Opportunities – Servers & Server Rooms

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Typical Energy Saving</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove idle applications &amp; consolidate applications on fewer servers</td>
<td></td>
<td>May also reduce licensing &amp; support costs</td>
</tr>
<tr>
<td>Enable server powersaving features</td>
<td>[awaiting data] of server load</td>
<td></td>
</tr>
<tr>
<td>Increase server room temperature set point at server intake to 23°C</td>
<td>Up to 10% of cooling load</td>
<td>Increase temperature gradually in 1°C increments. Ensure that temperature sensors are located at the intake side of servers, i.e. the cold aisle.</td>
</tr>
<tr>
<td>Server virtualisation</td>
<td>30-50% of server load</td>
<td></td>
</tr>
<tr>
<td>Post server virtualisation, relocate racks &amp; optimise cooling layout</td>
<td>Up to 50% of cooling load</td>
<td></td>
</tr>
<tr>
<td>Optimise the configuration of racks and cooling systems to segregate hot &amp; cold airflows from/to equipment, e.g. through improved rack layout and/or physical containment of hot &amp; cold aisles</td>
<td>Up to 20% of cooling load</td>
<td></td>
</tr>
<tr>
<td>Install blanking panels on gaps between racks</td>
<td>Up to 5% of cooling load</td>
<td></td>
</tr>
<tr>
<td>If availability requirements permit, power down servers when not in use (manually or using timers)</td>
<td></td>
<td>Savings are function of server downtime</td>
</tr>
<tr>
<td>If applicability dependent on building layout, May require server downtime</td>
<td></td>
<td></td>
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Other strategies – see report!
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