# Efficient use of Energy, the Management Process and Technology

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# Programme

- Energy Efficiency
  - by design and within existing plant and equipment
- Energy consumption and general good practice measures
- Sources of help and guidance

# The Impact of Climate Change

- The **Financial** impact
  - Energy is costing more and more to buy
  - It is unlikely to get cheaper
- The **Good Management** argument
  - An increased understanding that it is common sense to take control of anything that we have to keep on buying and using
- The **Energy and Environment** link
  - It is painfully apparent that the use of energy resources affects our world and our environment
- The **Customer** angle
  - Those who pay for our services expect value for money and minimal environmental impact
  - They do not accept our wasteful practices
- The **Legislation** stick?
  - More and more taxation and regulation is being applied to how we use energy
- Business and Practice changes

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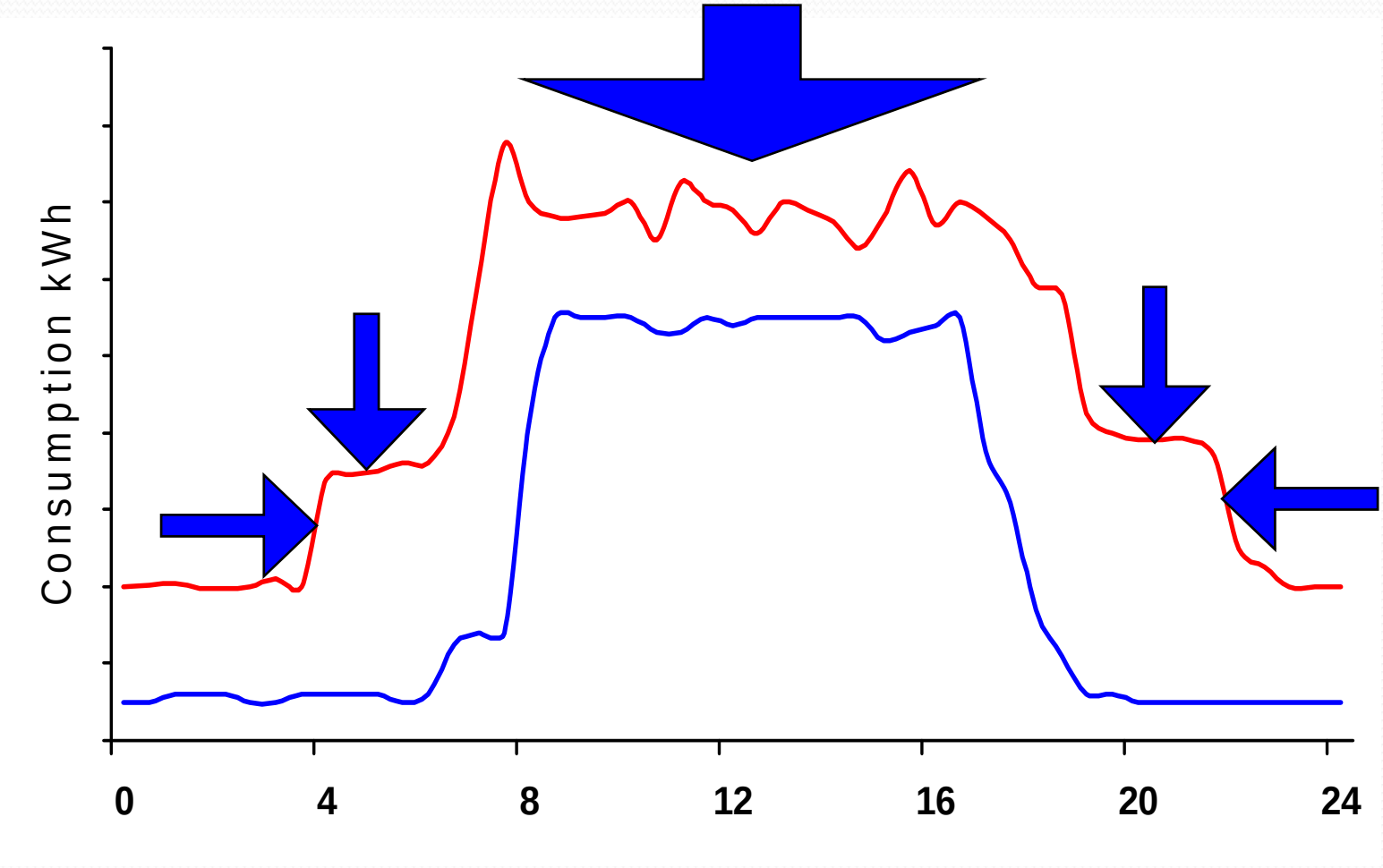
# Energy Consumption

- Lighting
- Heating
- Ventilation
- Air Conditioning / Comfort Cooling
- Office equipment
- Plant
  - Motors
  - Equipment
  - etc

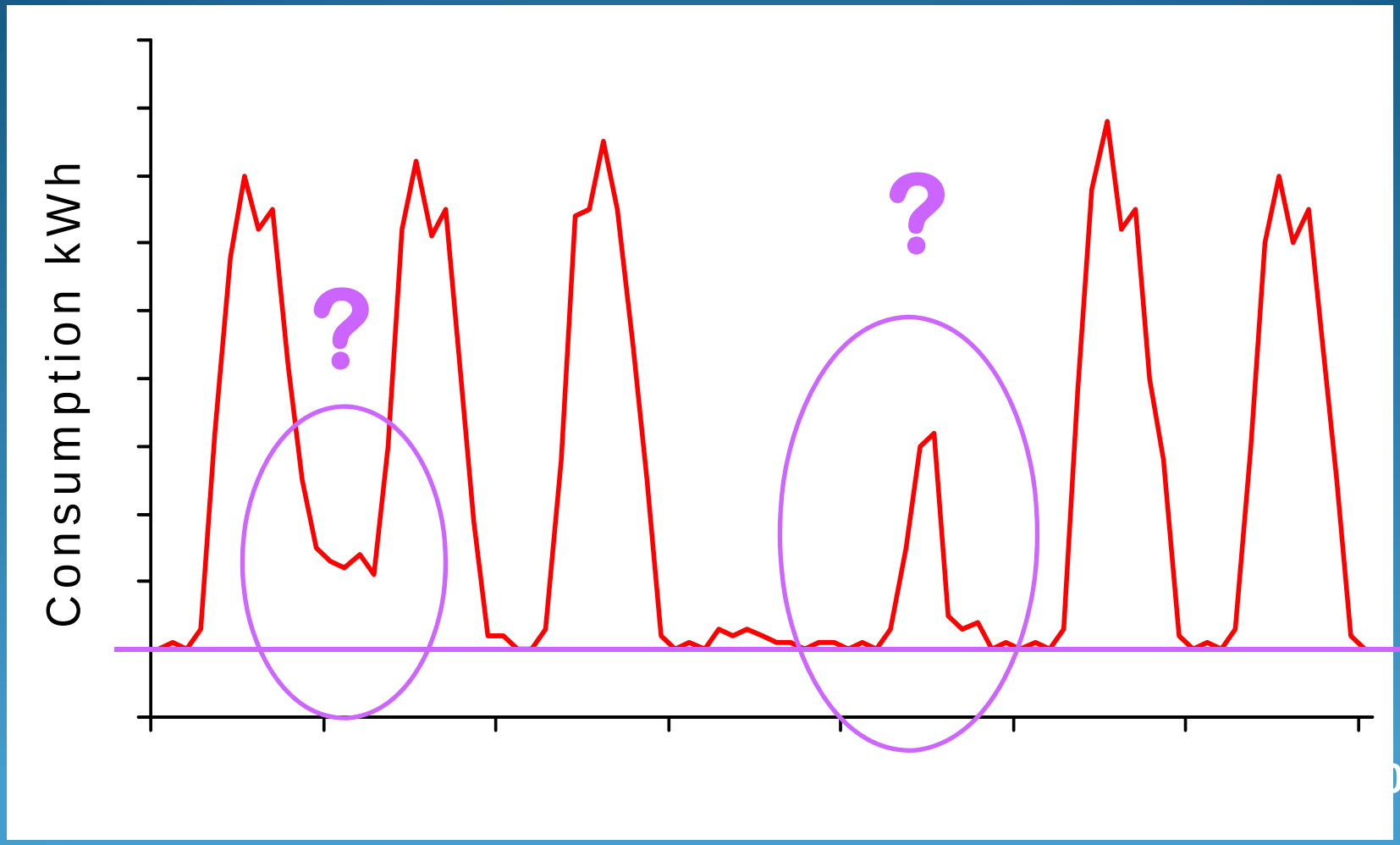
# Identifying waste

- Looking at the bills
- Monitoring usage patterns
- Benchmarking
- Common sense
- Taking regular inspection tours
- Carrying out energy audits and surveys
- Identifying the largest areas of waste
- Developing solutions

# Applying simple Energy Management Principles



# Weekly Consumption profile



# Solutions hierarchy

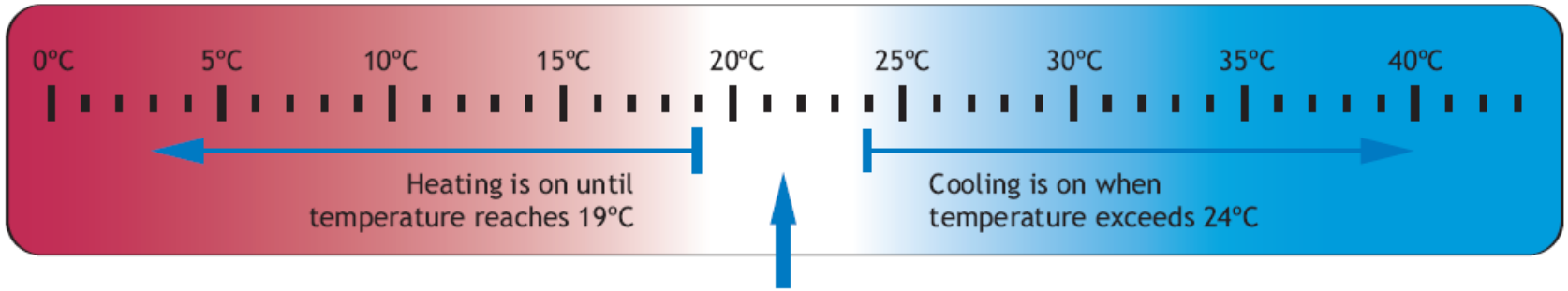
- No cost
- Low cost
- Future Investment

# Heating opportunities

- Maintain appropriate temperatures only during occupancy
- Weather compensation
- Ensure that controls match building occupancy
- Open doors and windows?
- Optimise temperatures
- Maintain boilers & pipe work
- Insulate
- Retain heat
- Do not heat & cool at the same time!

# Ventilation & Air Conditioning

*Figure 5 Diagram of 'dead band' control providing recommended temperatures*



# Ventilation & A/C opportunities

- Turn A/C off overnight
- Use natural ventilation & free cooling
- Keep windows & doors closed **IF** A/C in operation
- Do not operate at the same time as heating
- Maintain system components to ensure efficiency
- Pre cool overnight where practical
- Minimise the cooling load
- Consider variable speed drives on motors

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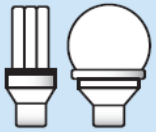
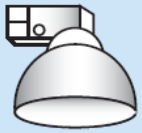
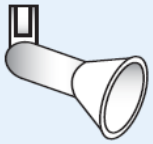
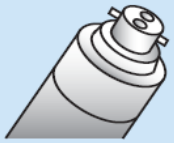
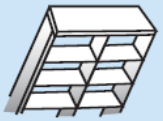
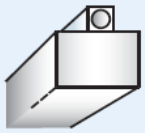
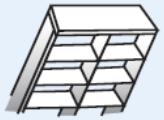
# Lighting

| Existing lamp type | Energy efficient option | Energy saving/benefits | Application notes |
|---|---|---|---|
|  Tungsten light bulbs |  Replace with compact fluorescent lamps (CFLs) in the same fitting | 75% saving plus longer lamp life | General lighting – modern CFL replacements may also be acceptable for display lighting |
|  38mm (T12) fluorescent tubes in switch-start fittings |  Replace with equivalent 26mm (T8) triphosphor fluorescent tubes of lower wattage | 8% saving plus longer lamp life | General lighting, but even better use with modern fittings (see below) |
|  High-wattage filament lamps or tungsten halogen lamps as used in floodlights |  Replace with metal halide or high wattage compact fluorescent lighting | 65-75% saving plus longer lamp life | Flood lighting and some general lighting situations |
|  Mains voltage reflector lamps, filament spot and flood types |  Replace with low-voltage tungsten halogen lighting or metal halide discharge lighting | 30-80% saving for equivalent lighting performance | Spot lighting in considered areas, such as reception or displays. If low voltage tungsten halogen spotlights are installed use 35W infrared coated (IRC) bulbs instead of the standard 50W bulbs |
|  Fluorescent fittings with the old 2ft 40W, and 8ft 125W fluorescent lamps |  Replace with efficient fittings using reflectors/ louvres or efficient prismatic controllers with high-frequency electronic or low loss control gear | 30-45% saving with much improved lighting quality. The use of high frequency electronic control gear eliminates flicker, hum and stroboscopic effect | General lighting |
|  Fluorescent fittings with opal diffusers or prismatic controllers which are permanently discoloured |  Replace with new prismatic controllers or replace complete fittings as above | No reduction in energy consumption but increases the amount of light by between 30% and 60% | General lighting |

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# Lighting opportunities

- Use daylight when available
- Choose correct lighting levels
- Involve staff in ‘switch off’ initiatives
- Label light switches
- Maintain light fittings
- Install low energy lighting
- Fit occupancy and daylight sensors
- Use modern fittings for factories and outdoors

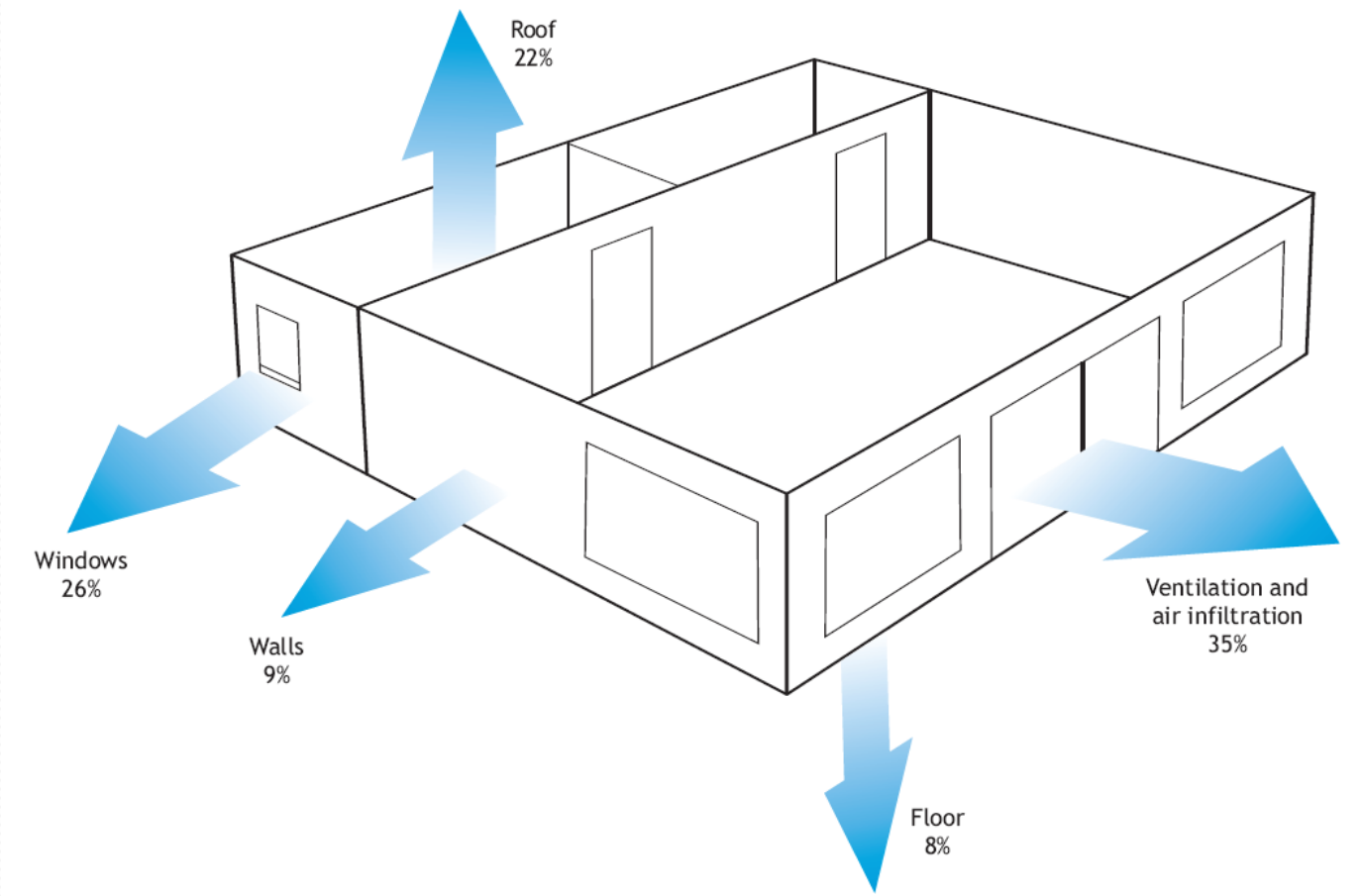
# Opportunities

- Make staff aware and responsible
- Train staff to take control
- Make energy waste a management issue
- Keep to minimum / maximum operating temperatures
- Schedule operations
- Recover waste thermal energy
- Consider solar water heating potential

# Electrical Equipment

- Match demand to supply
- Maintain equipment
- Standby to save energy
- Purchase energy efficient equipment
- Minimise catering energy costs
- Use energy efficient motors
- Where safe shut down vending machines out of hours

# The Building

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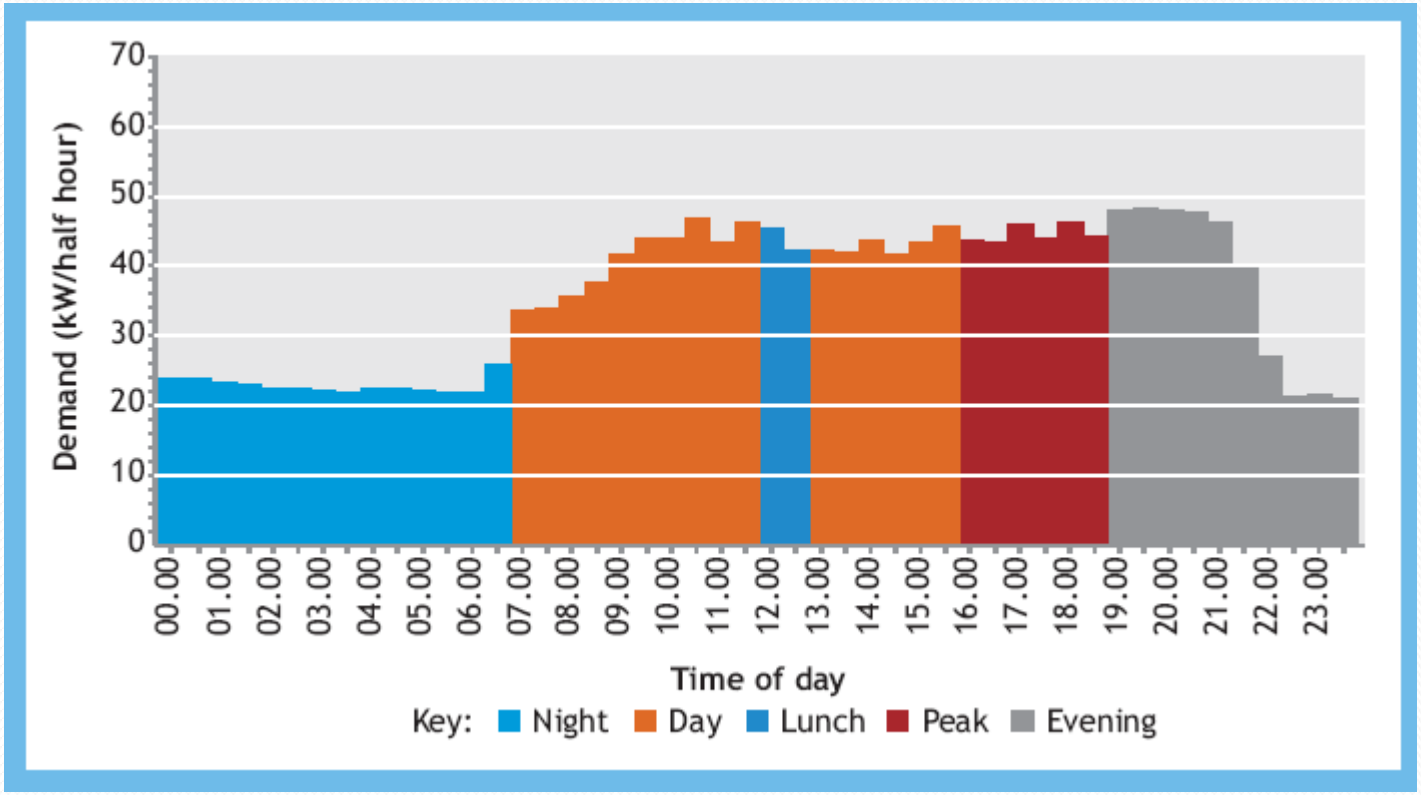
# Monitoring and Managing use

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# Benchmarking

***Figure 9*** *Energy consumption benchmarks for leisure facilities*

| Type | Good practice — fossil fuel (kWh/m²/yr) | Good practice — electricity (kWh/m²/yr) | Typical — fossil fuel (kWh/m²/yr) | Typical — electricity (kWh/m²/yr) |
|---|---|---|---|---|
| Centre with 25m Swimming pool | 573 | 152 | 1336 | 237 |
| Centre with leisure pool | 573 | 164 | 1321 | 258 |
| Combined centre (with more than one type of facility) | 264 | 96 | 598 | 152 |

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# Building opportunities

- Maintain and improve building fabric
- Involve staff in housekeeping and reporting
- Check for damp
- Insulate

# Good housekeeping and Energy Management

- Establish responsibility and commitment
- Create a property champion
- Involve staff and develop their commitment
- Control contractors
- Monitor energy use
- Set targets
- Undertake regular housekeeping walk rounds

# Checklist

Keyword -

**ACTION**

## Action checklist

Date of inspection

Check all areas within your facility and note items that need attention

| Main sports and leisure centre areas | ✓Checked | Further action required? | Comments |
|---|---|---|---|
| Measure temperatures regularly and check these against a list of preferred conditions | | | |
| Check for complaints about comfort conditions and report | | | |
| Check that heating controls/room thermostats are correctly set | | | |
| Ensure that lights are switched off when there is sufficient daylight | | | |
| Ensure that windows and doors are closed in heated areas | | | |
| **Pool areas** | | | |
| Check pool covers are used at the end of the day, including spa pools | | | |
| Check the pool hall air temperature is 1°C above the water temperature | | | |
| Check that sauna and steam rooms are off at the end of the day | | | |
| Check that hoses used to rinse poolside areas are fully turned off when not in use | | | |
| **Fitness rooms** | | | |
| Ensure air conditioning and/or heating is switched off at the end of the day | | | |
| Turn on air conditioning or heating as late as possible to meet comfort conditions | | | |
| Turn off all equipment overnight or when not in use | | | |
| **Changing rooms** | | | |
| Check hot water temperatures | | | |
| Turn off fans and lights at the end of the day | | | |
| Turn off unused taps or showers at regular intervals | | | |
| **External areas** | | | |
| Check external lighting is off during the day | | | |
| Use floodlights only when there are customers using the external facilities | | | |

# The six step plan

1. Understand your energy use
2. Identify opportunities
3. Prioritise your actions and solutions
4. Seek specialist help
5. Make the changes and measure the savings
6. Continue to manage energy efficiency

# Sources of help

- Independent Energy Consultants
  - Suitably qualified and experienced in sector
  - Chartered Energy Engineers
  - Registered as Low Carbon specialists
- The Carbon Trust – 0800 085 2005
  - Free surveys, grants, loans, part supported projects
  - Publications and many other services
- Energy Technology List

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Thank you for your attention and for reducing waste.