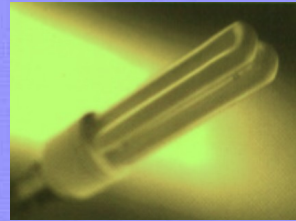


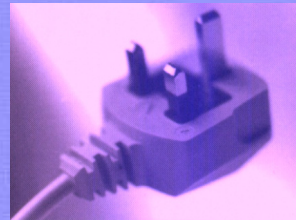
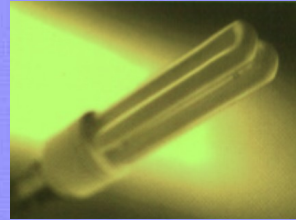
The Route to Energy Efficiency

Andrew Park
Swan Energy Limited



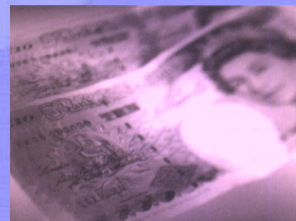
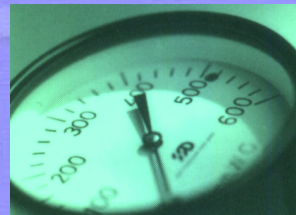
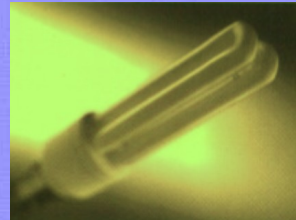
Agenda

- Why Energy Efficiency
- Energy Strategy
 - Commitment
 - Baseline
 - Energy policy
 - Management information
 - Energy efficiency measures
 - Awareness and training
 - Performance publication
 - Review progress
- Next Steps



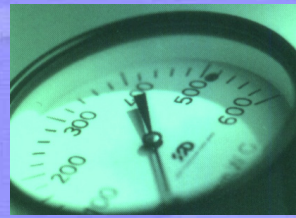
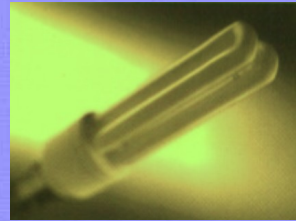
Why Energy Efficiency

- Corporate Social Responsibility
- Climate change
- Resource depletion
- Cost reduction



Corporate Social Responsibility

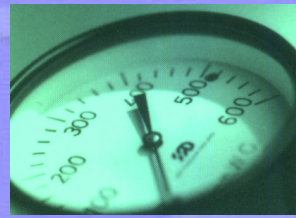
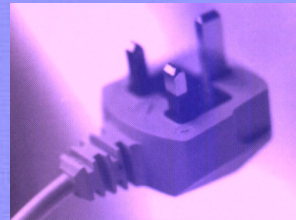
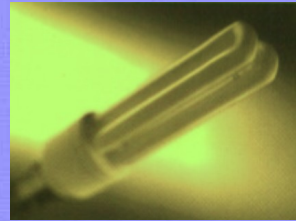
- Acorn Scheme
- BS 8555
- Six stage approach
 - Commitment and establishing the baseline.
 - Identifying and ensuring compliance with legal and other requirements.
 - Developing objectives, targets and programmes.
 - Implementation and operation of the environmental management system.
 - Checking, audit and review.
 - Environmental management system acknowledgement.



Climate Change



Pasterze Glacier 1875

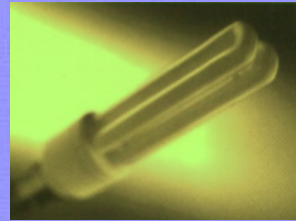


Climate Change

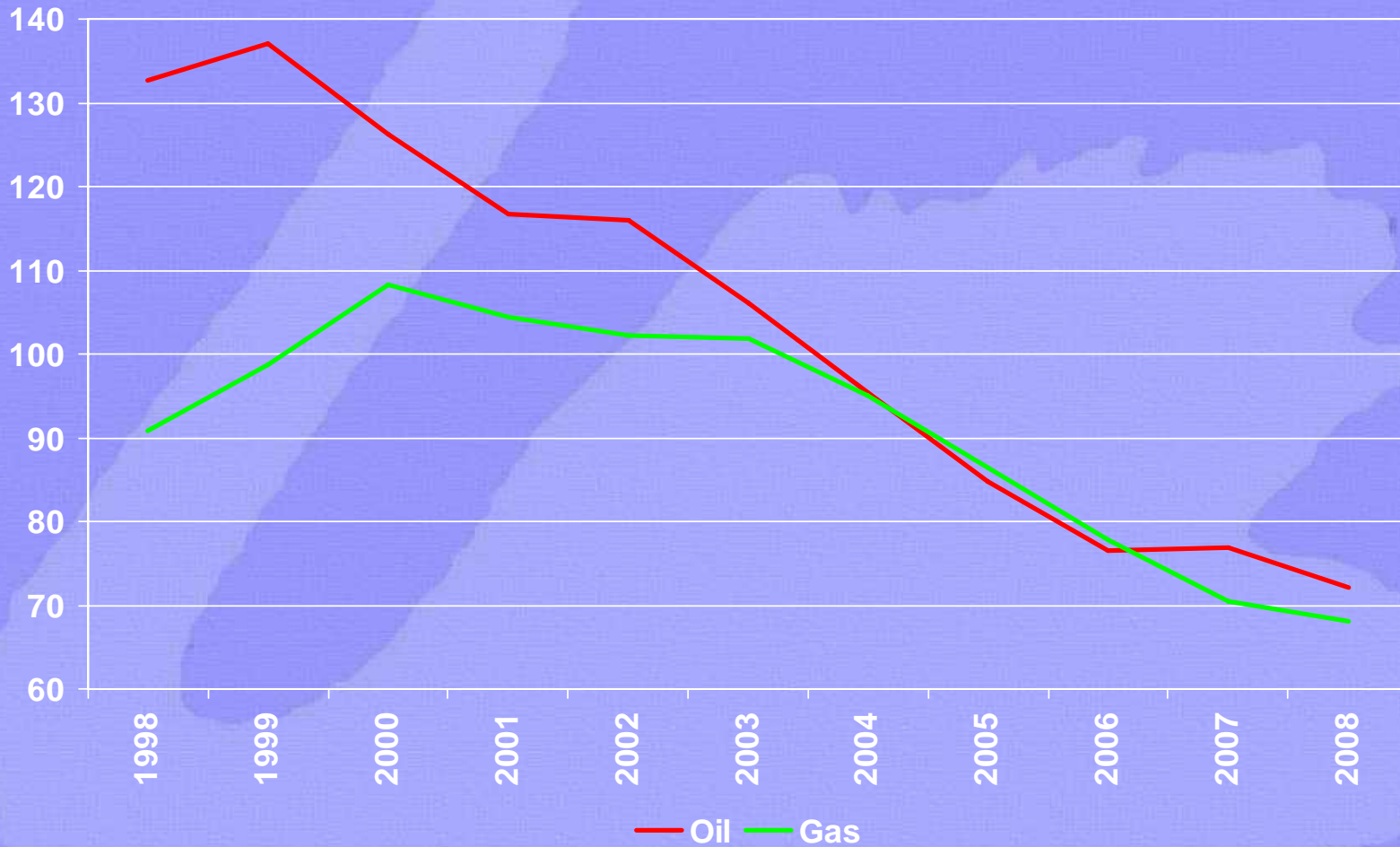
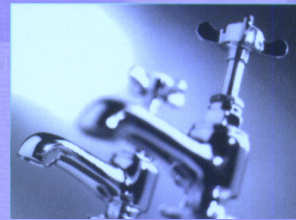
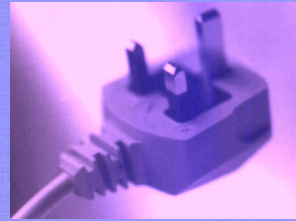
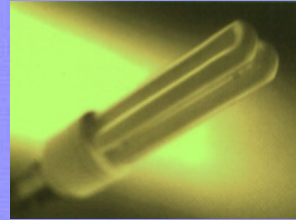


Pasterze Glacier (site), Austria

© 2004 Gary Braasch

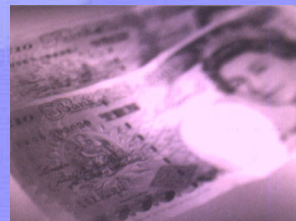
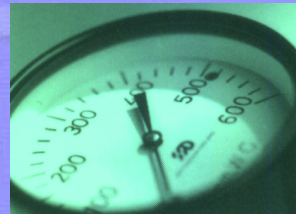
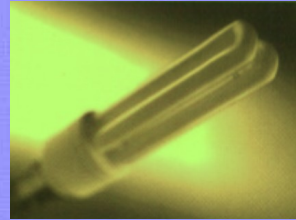


Resource Depletion



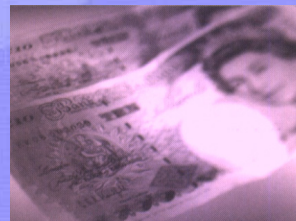
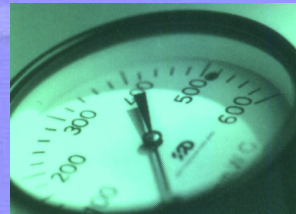
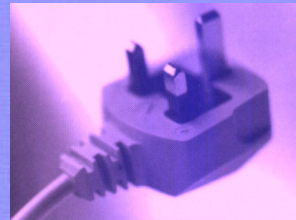
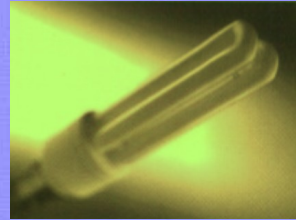
Cost Reduction

- Only two ways to reduce energy expenditure
 - Buy it cheaper
 - Use less



How to Improve Energy Efficiency?

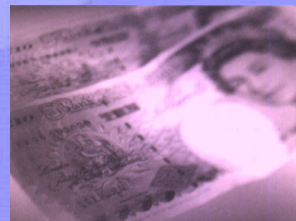
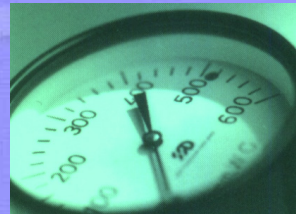
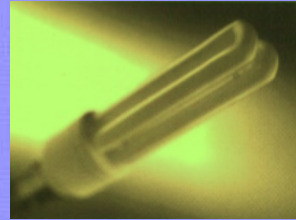
- **Energy Strategy**
 - Commitment from the top
 - Current Performance
 - Energy Policy
 - Objectives and targets
 - Action plan
 - Roles and responsibilities
 - Management information
 - Monitoring and targeting
 - Corrective action
 - Investment in energy efficiency measures
 - Employee awareness and training
 - Publish energy performance
 - Review progress



Commitment

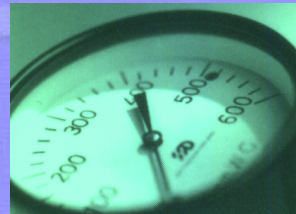
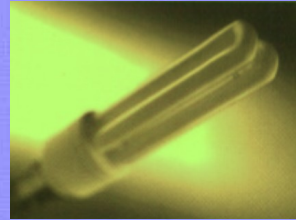
- Clear structure
- High level commitment
- Personal endorsement by senior management
- Example setting

- Convincing case
- Proposed strategy
- Company goals



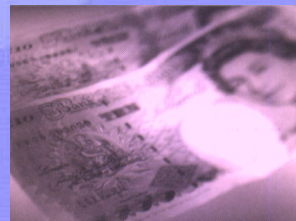
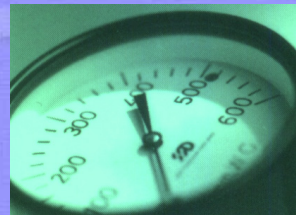
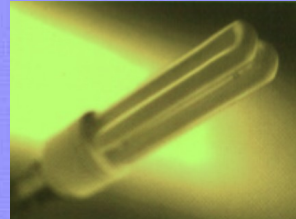
Current Performance

Level	Policy	Organising	Training	Performance Measurement	Communicating	Investment
4	Energy policy, action plan and regular review have active commitment of top management	Fully integrated into management structure with clear accountability for energy consumption	Appropriate and comprehensive staff training tailored to identified needs, with evaluation	Comprehensive performance measurement against targets with effective management reporting	Extensive communication of energy issues within and outside of organisation	Resources routinely committed to energy efficiency in support of business objectives
3	Formal policy but no active commitment from top management	Clear line management accountability for consumption and responsibility for improvement	Energy training targeted at major users following training needs analysis	Weekly performance measurement for each process, unit, or building	Regular staff briefings, performance reporting and energy promotion	Same appraisal criteria used as for other cost reduction projects
2	Un-adopted Policy	Some delegation of responsibility but line management and authority unclear	Ad-Hoc internal training for selected people as required	Monthly monitoring by fuel type	Some use of company communication mechanisms to promote energy efficiency	Low or medium cost measures considered if short payback period
1	An unwritten set of guidelines	Informal, mostly focused on energy supply	Technical staff occasionally attend specialist courses	Invoice checking only	Ad-Hoc informal contacts used to promote energy efficiency	Only low or no cost measures taken
0	No explicit energy Policy	No delegation of responsibility for managing energy	No energy related staff training provided	No measurement of energy costs or consumptions	No communication or promotion of energy issues	No investment in improving energy efficiency



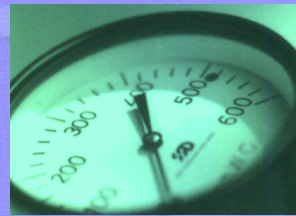
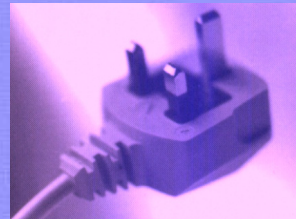
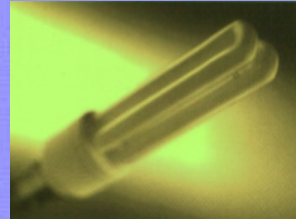
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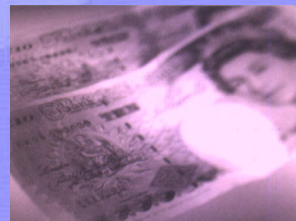
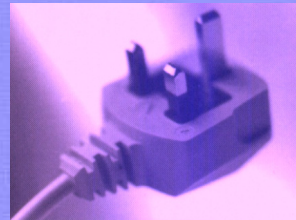
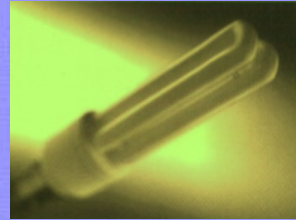
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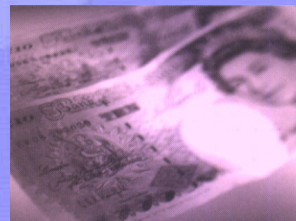
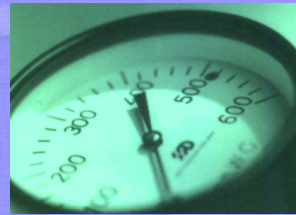
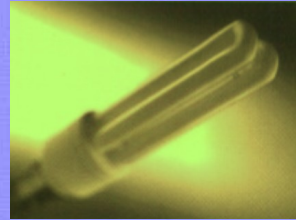
Energy Policy

- **Published documents**
 - Chairman's statement
 - Corporate policy statement
- **Internal documents**
 - Strategic action plans
 - Targets set
 - Updated annually
 - Management system
 - Assigns responsibilities
 - Designates review periods
 - Identifies audit arrangements



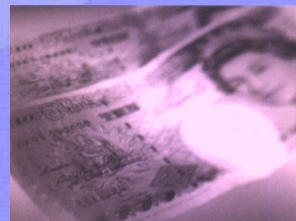
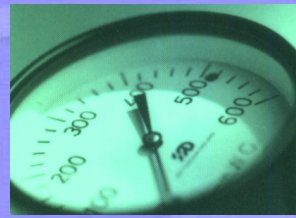
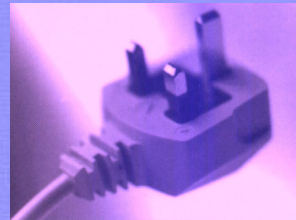
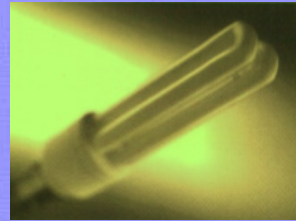
Management Information

- **Monitoring and targeting**
 - In house or bureau service
 - Invoice based or meter readings
 - Frequency
 - Recipients
 - Corrective action
 - Metering
 - aM&T



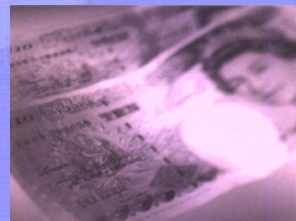
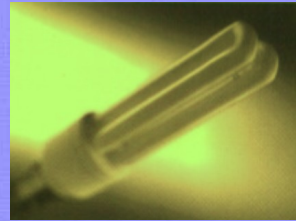
Investments in Energy Efficiency

- Investing in people
 - Training
 - In energy management
 - In energy awareness
 - External specialist support and advice
- Investing in plant and equipment
 - Energy efficiency projects
 - Energy efficiency included in other projects



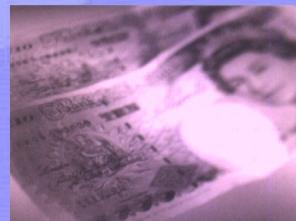
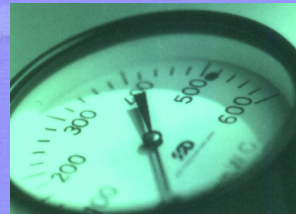
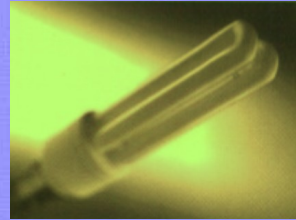
Investments in Plant and Equipment

- Budget provision
 - Hypothecation of savings realised
 - Payback period
 - Ring fencing
- Technology Sectors
 - Lighting
 - Heating and ventilation
 - Motive power
 - Compressed air



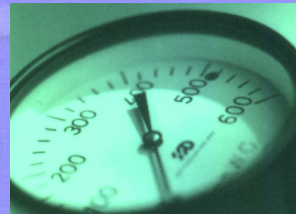
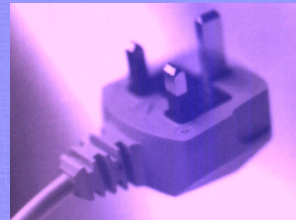
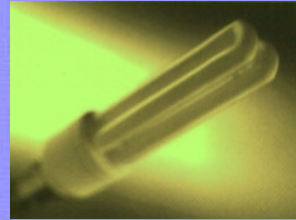
Lighting

- Maintenance
- Lighting design
- Lighting technology
 - Lamp types
 - Fittings (luminaires)
- Lighting controls
 - Zoning
 - Switches and dimmers
 - Presence detection
 - Daylight linking
 - Time control



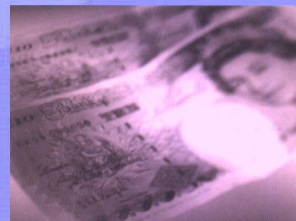
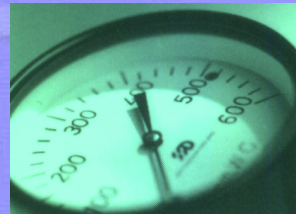
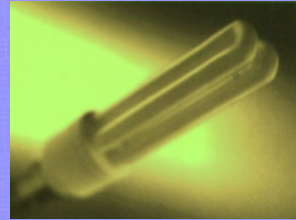
Heating and Ventilation

- Maintenance
- Air conditioning & comfort cooling
- Insulation
- Heating Technology
 - Boilers
 - Burners
 - Pumps and fans
- Heating Controls
 - Legal constraints
 - Thermostats
 - BEMS
 - Combustion control
- Ventilation
 - Fan laws
 - Fan control
 - Recirculation
 - Air quality



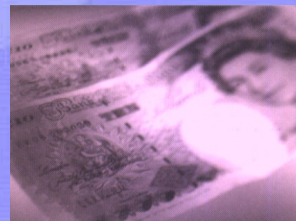
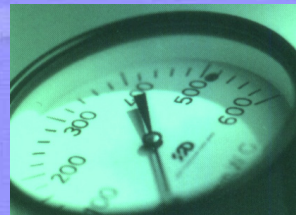
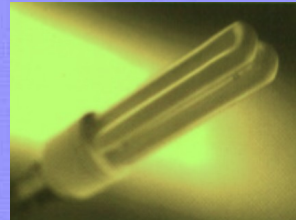
Motive Power

- **Motors**
 - Reduce torque
 - Check voltage
 - If <50% load reconnect in star
 - Reduce speed
 - VSD v PIV
 - Reduce time
 - Idling machinery
 - Soft start
 - Improve motor efficiency
 - HEM
 - Improve machine efficiency
 - Maintenance



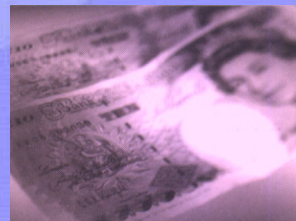
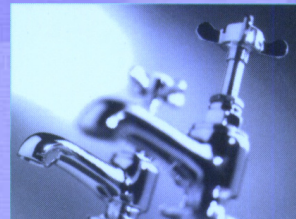
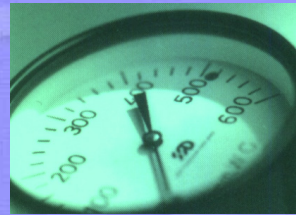
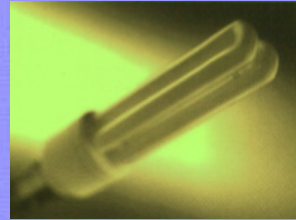
Compressed Air

- Maintenance
 - Leaks
 - Compressors
- Controls
- Pressure
- Time
- Misuse
 - Blow guns
 - Vacuum venturis
 - Product ejection
- Leaks
- Compressor selection
- Heat recovery



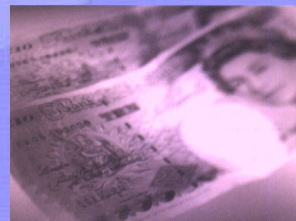
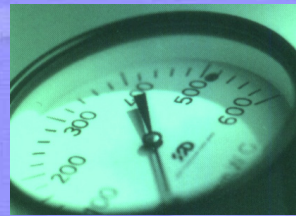
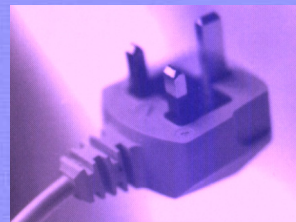
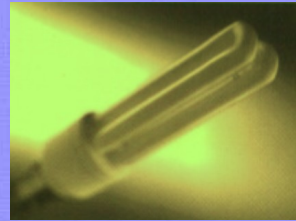
Energy Awareness

- Posters & stickers
- Notice boards
- Newsletters
- Screensavers
- Competitions
- Training sessions
- Charity linking
- Community outreach



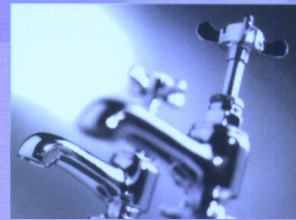
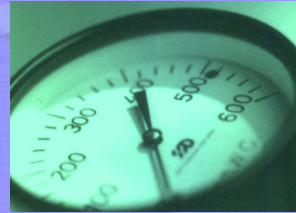
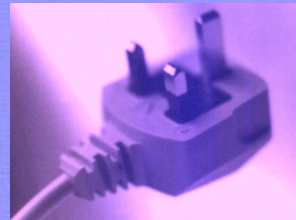
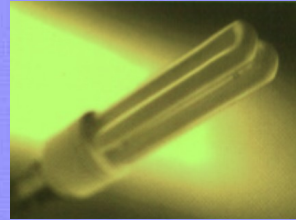
Publicise Energy Performance

- Inform people on activities & achievements
- Gain influence with energy users & decision makers
- Initiate new energy programmes
- Securing commitment & resources
- Justifying time and money spent



Review Progress

- Regularly
- KPI
- Specific energy consumption
- Public reporting
- Training needs
- Future investment
- Maintenance of achievements



Next Steps

- Commitment
- Energy Policy
- Action plan
- Roles and responsibilities
- Monitoring and targeting

In place?

Who?

Who?

Senior level reporting

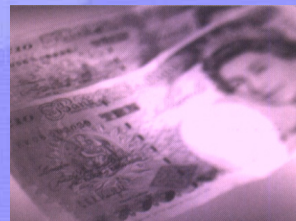
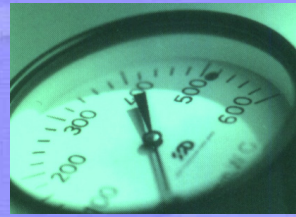
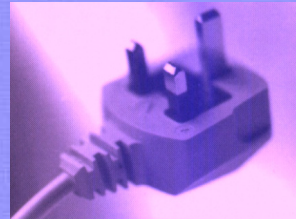
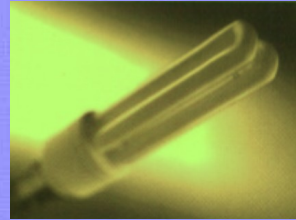
Day to day responsibility

Local responsibility

In house or bureau?

Spreadsheet or custom?

Corrective action



Next Steps

- Investment

Budget provision

Projects

Training

- Awareness

Induction

Posters & stickers

Screen saver?

In house publications

- Energy performance

Notice boards

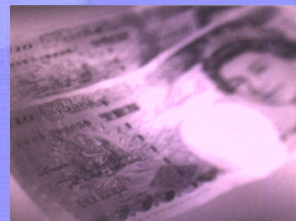
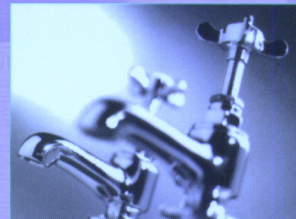
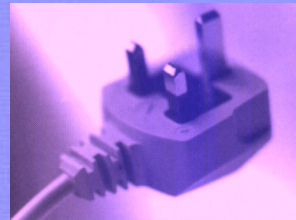
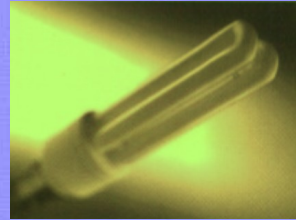
In house publications

- Review progress

Locally

Centrally

Frequency?



Summary

- Energy efficiency increasingly important
- Implement an energy strategy incorporating
 - Energy policy
 - Action plan
 - M & T
 - Awareness & training
 - Continuous review

