





**envirowise** } Resource Efficiency  
Gregor Pennie



### Resource and Waste

- Waste is at the heart of sustainable development:
  - 100 million tons of commercial and industrial waste annually
  - New figures released next month
  - C & I waste is more likely to generate harmful greenhouse gases, and 4.7% of Wales's greenhouse gas emissions from waste
- Government targets to:
  - To reduce landfill for industrial and commercial waste through The E8 escalator waste will cost £80 per tonne by 2015. Initially £7 in 1997
  - C&I waste sent to landfill fell by only 2.3 million tonnes (11 per cent) between 2005 and 2008. Given this rate of progress, DEFRA may not meet a 20% reduction by 2010.



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### Why Bother ? A Reminder...



- 1 tonne of biodegradable waste produces 200 - 400m<sup>3</sup> of landfill gas which contains typically 50% Methane CH<sub>4</sub> with most of the remainder being Carbon Dioxide CO<sub>2</sub>.
- Landfill tax at £48.00 per tonne. Landfill now costs over £100/tonne (tax + gate fee + transport)
- Reduce cost of materials as you reduce, reuse and recycle
- Good waste management is good business - promote yourself to good effect with customers, clients, staff, the public and suppliers
- There are good environmental reasons – don't ignore saving money!



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### The Steps




1. Commit to Reducing Waste
2. Involve Everyone
3. Form a Team to Lead
4. Appoint a Champion
5. Review your Waste
6. Set the Action Plan
7. Monitor
8. Celebrate




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### Measuring And Estimating Waste




- Review existing practices to identify opportunities for minimising wastes and improving the efficient use of resources
- Know where wastes are produced and where raw materials are used
- Estimate how much this is costing you each year




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### A Waste Audit Should..



- Identify all points at which waste is generated
- Identify the origin of each type of waste
- Monitor the waste to identify its quantity and type, and its environmental effects
- Establish methods of measuring for monitoring purposes
- Identify the costs of the current disposal methods, including treatment, handling, storage and transport.
- Look at opportunities to reduce, recycle or re-use waste
- Set targets for reducing waste



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### Gathering And Organising Information



- Where you find the information in your company
- Map out how you are using resources
- Build a picture of your processes
- See the true cost of waste
- Set priority areas for waste reduction
- Use the Envirowise tools



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### Where Do You Find Information?



- Company records and reports
- Invoices and purchase ledgers
- Energy and water meters and bills
- Waste disposal bills
- Effluent discharge consents
- Authorisations to operate processes
- Process maps and flow diagrams of operations
- Duty of Care documents
- Packaging waste data forms



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### Map Your Wastes



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### Undertake a Waste Sort



#### Easy Method

- Issue clear bags for a given day/week
- Bags to be left at skip/wheelie bin etc.
- End of day, weigh each bag and visually estimate % content of key materials, paper, card, plastic, wood metal etc.
- Weigh a few samples out of the bags if required
- Calculate total weight and % weight of each material component

Gloves (cut proof), Scales, Shovel, Brush, Clipboard Labels, Pens, First aid kit

#### Harder

- Segregate waste sample into major components and weight each material (sub divide if needed e.g. glass – clear brown green)
- For both calculate the daily weight of the component
- Net component weight x No of working days  
= Weight of waste/annum



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### Useful Facts About Waste Skips



- Standard size 4.5m<sup>3</sup> or 6 yds<sup>3</sup>
- Standard size 9m<sup>3</sup> or 12 yds<sup>3</sup>
- Standard size 15m<sup>3</sup> or 20 yds<sup>3</sup>
- Standard size 24m<sup>3</sup> or 36 yds<sup>3</sup>



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### Skip Weight Estimates



Typical Skip waste densities (tonnes/m<sup>3</sup>) [Loose]

- Paper 0.34
- Cardboard 0.30
- Glass 0.45
- Plastic Bottles 0.03
- Domestic refuse 0.15 - 0.25



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### Useful Facts About Waste Bins



Standard sizes  
90, 120, 140, 240 and 360 litres (wheelie bins)



Standard sizes  
700, 800, 1000 and 1100 (Eurobin) litres



Density of wastes

- Mixed domestic waste 0.25 tonnes/m<sup>3</sup>
- Cardboard waste 0.35 tonnes/m<sup>3</sup>
- Glass waste 0.45 tonnes/m<sup>3</sup>



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### Useful Facts About Waste Amounts



- Black bin bag ..... 6kg
- Sack of paper ..... 10kg
- Box A4 paper (5 reams) ..... 12kg
- 240l bin ..... 40kg
- 1100l euro ..... 120kg
- Front end loader (FEL 7.7m<sup>3</sup>) ..... 7 tonnes
- Rear end loader (10.7m<sup>3</sup>) ..... 11 tonnes
- Laser printer toner cartridge ..... 2kg
- 50,000 drinks cans ..... 1 tonne
- 250,000 plastic vending cups ..... 1 tonne







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### Plastic Types




- 1 PETE** Polyethylene Terephthalate (PET) - Soda & water containers, some waterproof packaging.
- 2 HDPE** High-Density Polyethylene - Milk, detergent & oil bottles, Toys and plastic bags
- 3 V** Vinyl/Polyvinyl Chloride (PVC) - Food wrap, vegetable oil bottles, blister packages.
- 4 LDPE** Low-Density Polyethylene - Many plastic bags. Shrink wrap, garment bags, recycled LDPE are plastic trash bags and grocery sacks, plastic tubing, agricultural film, and plastic lumber.
- 5 PP** Polypropylene - Refrigerated containers, some bags, most bottle tops, some carpets, some food wrap.
- 6 PS** PS Polystyrene - Throwaway utensils, meat packing, protective packing.
- 7 OTHER** Usually layered or mixed plastic. No recycling potential - must be landfilled.

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### Rules Of Thumb


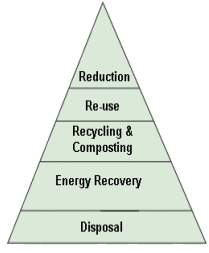


- Make your best estimates
- Number of skip lifts, composition and weights
- Electricity consumption per output of product
- Water consumption per output of product
- Metering and monitoring energy & water
- Comparison with industry best practice



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### Waste Management Hierarchy

Highest priority

↑

- Reduction
- Reuse
- Recycling & Composting
- Energy Recovery
- Disposal

Lowest priority

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### Interactive Waste Audit







The following exercise has a number video clips to help you think laterally about your site and identify opportunities for waste minimisation.

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### Introduction



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### Example Site




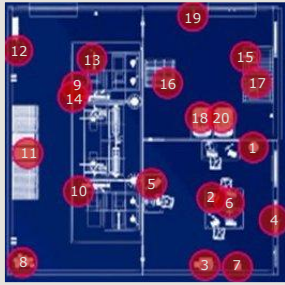

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### Results

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### Summary

Results for the Tour


1. Waste Bin	11. Waste Segregation
2. Printer	12. Water Leak
3. Photocopier	13. Steam Leak
4. Open Window	14. Air Leak
5. Lamp	15. Poor Packaging
6. PC Monitor	16. Over Packaging
7. Plastic Cups	17. Poor Labelling
8. Open Paint tins	18. Poor Waste Segregation
9. Oil Leak	19. Tap Running
10. Spilled Product	20. Pallets not Reused

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**envirowise** } Better Management through Key Environmental Performance Indicators


### Key Environmental Performance Indicators



(KEPI's)

- Measures performance
- Tracks performance
- Helps identify opportunities

Therefore: Saves money, resources, waste and pollution



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### Key Environmental Performance Indicators

The impacts of organisations on the environment can be complex, and will vary according to the size and nature of your organisation. So how can you measure and report impacts in a way that is meaningful?

- Indicators relevant to all organisations
- Indicators that apply to certain organisations

Energy consumption	2004	2005
Gas (GWh)	10.9	10.3
Coal (GWh)	0.0	0.0
Oil (GWh)	0.0	0.0
Electricity (GWh)	6.7	4.3
CO <sub>2</sub> (GWh)	0.8	0.8
Total energy (MWh)	234	211
Green energy (%)	21%	20%
CO <sub>2</sub> emissions (tonnes)	6,049	5,884

### Indicators Relevant To All

KEPI	Units
Greenhouse gas emissions	Total tonnes of carbon dioxide equivalents
Water consumption	Total tonnes of water abstracted and purchased
Waste(Non-product output)	Tonnes of waste sent to disposal from company sites

### Categories of KEPI's

- Absolute – key resource
  - litres of water per year, tonnes of waste per month
- Relative – specific measure
  - litres of water per tonne of product, kg waste per item made or a % i.e. raw material to product
  - Area coated with paint in m<sup>2</sup> as appropriate unit to measure production
- Weighted – factor applied

### Choosing KEPI's

- You need your own set
- Cover your range of issues
- Check your sector and clients
- Use the process map
- Remember
  - Which data are available
  - What is practical

### Using KEPI's

Trends


Comparative

### Monitoring and Control

Cumulative sum graph measures product used minus a standard, perhaps averaged over a previous period. Provides a zero control line.




**envirowise** Workshop  
Key Environmental  
Performance Indicators




### KEPI's Workshop

- Calculate the absolute KEPI's for energy, waste & water the the relative indicators related to turnover and production
- What targets would you set for the company?
- How would you measure them if they are going to be met next year?
- Why is it important to relate to product and turnover?



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### Results

Parameter	Consumption 2005/6		KEPI per £K turnover	KEPI per m <sup>2</sup> of product
<b>Energy</b>				
		Tonnes CO2		
Oil (Heavy)	20,000 litres	60.24	0.02 tCO <sub>2</sub> /£K	0.006 tCO <sub>2</sub> /m <sup>2</sup>
Electricity	400,000 kWh	246.8	0.082 tCO <sub>2</sub> /£K	0.025 tCO <sub>2</sub> /m <sup>2</sup>
<b>TOTAL</b>		<b>307</b>	<b>0.102</b>	<b>0.031</b>
<b>Water</b>				
Mains Water	2100 m <sup>3</sup>		0.7	0.21
Effluent	1500 m <sup>3</sup>		0.5	0.15
<b>TOTAL</b>		<b>3600</b>		
<b>Waste</b>				
Landfill	52000 kg		17.3	5.2
Recycled	10000 kg		3.3	1
<b>TOTAL</b>		<b>62000</b>		
<b>Packaging</b>				
From Suppliers	5000 kg		1.6	0.5
Bought in	6000 kg		2	0.6
Recycled	800 kg		0.27	0.08
<b>TOTAL</b>		<b>11800</b>		
<b>Special Waste</b>				
Ink	1200 kg		0.4	0.12
Tins	800 kg		0.27	0.08
Solvent	2000 kg		0.7	0.2
<b>TOTAL</b>		<b>4000</b>		

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### Benchmarking

Don't forget you can benchmark not only against yourself but your sector / operation.

Area	Icon
Energy consumption	
Weight	
Recycling and disposal	
Packaging	
Hazardous substances	




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### Benchmark 1

- Paper - 7 reams of paper /person/year
- Waste - 200 kg waste paper/person/year
- Recycling - 60-70% recycling rate for paper, card, glass, toner, cans
- Water - 7700 litres (7.7 m<sup>3</sup>) /person/year
- Transport - no official figures




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### Benchmark 2

- Electricity
- 33kWh/m<sup>2</sup> small office
- 54kWh/m<sup>2</sup> naturally ventilated open plan
- 128kWh/m<sup>2</sup> air conditioned open plan
- 234 kWh/m<sup>2</sup> headquarters
- Typical practice 2/3 higher electricity use



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### When You Get Back

- Get management commitment
- Conduct a waste survey
- Find out costs and quantities of wastes
- Set your KEPIs
- Decide priorities for action
- Use the support available



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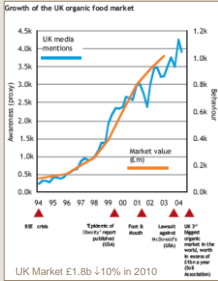
### Coffee



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### Carbon Responsibility

- Climate Change mainstream issue
- Purchase Behaviour modified
- Your reputation
  - staff, suppliers, shareholders
- Small change big impact
  - Leaded petrol, tuna, organic foods
- Lead time for action?



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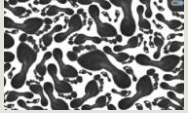
### Calculating Your Carbon Footprint

**Energy**  
Your gas, oil & electricity consumption - all generates CO<sub>2</sub>

**Travel**  
Corporate travel by road / air adds substantial CO<sub>2</sub>

**Freight**  
Product shipping / distribution

**Process Emissions**  
Do you expel any other GHGs into the atmosphere ?



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### Collecting Information

<b>Energy</b>	Annual Consumption	Units
	Electricity	kWhr
	Natural Gas	kWhr or Therms or cuft
	Petrol (not vehicles)	litres
	Diesel (not vehicles)	litres
	LPG	litres
	Gas Oil	litres
	Fuel Oil	litres
<b>Travel</b> (Business related - not getting to work)	Aircraft	miles/Km
	Bus	miles/Km
	Rail	miles/Km
	Cars	miles/Km
<b>Freight</b>	Units	
	Articulated	miles/Km
	Rigid	miles/Km
<b>Process Emissions</b>	Perchloroethylene	litres or Kg (lost to atmosphere)
	Other	



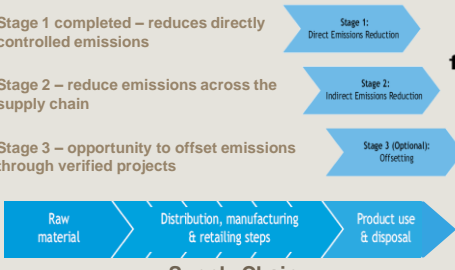
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### Environment Footprint

Stage 1 completed – reduces directly controlled emissions

Stage 2 – reduce emissions across the supply chain

Stage 3 – opportunity to offset emissions through verified projects



**carbon footprint**

**Carbon Neutral!**

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### Reporting Standards

**GHG Protocol**

- World Resources Institute and World Business Council for Sustainable development
- Globally accepted
- Sets boundaries and standards

www.ghgprotocol.org

ISO 14064 – Accreditation Requirements

Corporate Accounting and Reporting Standards

Project Accounting Protocol and Guidelines

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### Emission Scopes

CO<sub>2</sub> CH<sub>4</sub> N<sub>2</sub>O HFCs PFCs SF<sub>6</sub>

**Scope 2 Indirect** (Purchased Electricity for own use)

**Scope 1 Direct** (Vehicles, Fugitive emissions, Fuel)

**Scope 3 Indirect** (Business travel, Waste Disposal, Contactor Vehicles, Materials and Outsourced activity)

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### Set Boundaries

- Financial or operational control
- Owned and leased assets
- Emission sources

The Organisation

Division A	Division B	Division C
10,000 tCO <sub>2</sub>	30,000 tCO <sub>2</sub>	50,000 tCO <sub>2</sub>
50% Financial 0% Operational	50% Financial 100% Operational	100% Financial 100% Operational

Production of raw materials → Distribution of raw materials → **The Organisation** → Distribution of Products → Retail and End Use → Disposal

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### Financial & Operational Boundaries

The Organisation

Division A	Division B	Division C
10,000 tCO <sub>2</sub>	30,000 tCO <sub>2</sub>	50,000 tCO <sub>2</sub>
50% Financial 0% Operational	50% Financial 100% Operational	100% Financial 100% Operational

tCO <sub>2</sub>	Financial Boundary	tCO <sub>2</sub>	Operational Boundary
Division A	5,000	Division A	0
Division B	15,000	Division B	30,000
Division C	50,000	Division C	50,000
Organisation	70,000	Organisation	80,000

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### Example Calculation

Company A

- Gas: 100,000 kWh
- Company Car Petrol: £150,000
- Electricity: 8,000,000 kWh
- Air Travel (12 Flights): 18,720 km

Guidelines to Defra's GHG Conversion Factors April 2008  
www.defra.gov.uk/environment/business/envr/pdf/ghg-cf-guidelines-annexes2008.pdf

Gas = 100,000 kWh x 0.206 kgCO<sub>2</sub>/kWh = 20,600 kgCO<sub>2</sub>

Petrol = £150,000 x £1.15 / l x 2.315 kgCO<sub>2</sub>/l = 339,337 kgCO<sub>2</sub>

Electricity = 8,000,000 kWh x 0.53702 kgCO<sub>2</sub>/kWh = 4,296,160 kgCO<sub>2</sub>

Air Travel = 18,720 km x 0.1753 kgCO<sub>2</sub>/km x 1.09 (uplift) = 3,576 kgCO<sub>2</sub>

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Fuel type	Conversion factor (kg CO <sub>2</sub> /unit)	Net CV (MJ/unit)
Electricity	0.53702	3,600
Gas	0.206	39,400
Petrol	2.315	43,000
Coal	2.92	29,300
Oil	2.315	43,000
Wood	0.1753	16,000
Waste	0.1753	16,000
Other	0.1753	16,000
Total of electronic energy	0.53702	

### Carbon Reduction Label

- The Carbon Trust has launched a new carbon reduction label
- Measure of a products carbon footprint across its life cycle from source to disposal
- www.carbon-label.co.uk
- Brand value and climate change - consumer attitudes are approaching a 'tipping point' on the issue and that billions of pounds of brand value are at risk

working with the Carbon Trust


**CARBON TRUST** Making business sense of climate change

100g CO<sub>2</sub>

The UK's carbon footprint is 648 million tonnes of Carbon Dioxide (CO<sub>2</sub>) per year

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### One Major Retailer

**TESCO** 

**2050 target to be a zero-carbon business**

This year we set ourselves the target of reducing the emissions of the products in our supply chain by 30% by 2020

**CO<sub>2</sub>e emissions per square foot**

Year	2005	2006	2007	2008	2009
Value	76.51	64.62	62.61	56.33	54.30

**CO<sub>2</sub>e by case of goods delivered (kgCO<sub>2</sub>e/case)**

Year	2005	2006	2007	2008	2009
Value	0.199	0.176	0.162	0.156	0.146


**CO<sub>2</sub>e by source (%)**

Source	1 Grid electricity	2 Buildings	3 Transport	4 Natural gas (LPG)	5 Business travel
Percentage	86.8	10.1	11.8	8.9	1.4

**Change the Hotspot**

- Footprinting has shown us that the differences between brands within a category matter much less than how an entire category is typically manufactured or used.
- We will cement collaboration among businesses taking a 'life cycle view' and cooperating within, and across, industry sectors will be particularly important in making change occur. <http://cr2010.tescopl.com/environment/climate-change.aspx>

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### Tesco Measures Carbon



- Tesco has measured the carbon footprint of 500 products, including tomatoes, potatoes, orange juice, light bulbs and washing detergent.
- It is hoped the labelling scheme will become a national standard.
- This encompasses almost every industry: agriculture, processing, transport, freight, supermarkets, packaging, food manufacturing.
- The rest of the world?

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### Supply Chain of Daily Mirror Group




The average Daily Mirror has a weight of 182g and a carbon footprint of 0.98Kg CO<sub>2</sub> per Kg of newspaper sold.

**Figure 9: Companies engaged in the data collection process**

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At 2 million copies/day - 400 tonnes CO<sub>2</sub>

### Example – Daily Mirror




**Figure 10: Carbon footprint of the Daily Mirror**  
g CO<sub>2</sub> per final newspaper sold

**Solutions**


- Product Change - reduce no of pages, reduce no of glossy pages
- Buy paper from low energy supplier

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### Cutting Carbon and Costs




**enviowise** } Energy  
Water  
Waste




Use your head

### Understanding Energy Use & Billing



- Authorised supply capacity kVA
  - Available Supply Capacity (ASC) – measured in kVA
  - Agreed maximum - negotiable after 5 years
  - Relates to highest Maximum Demand in year
- Maximum demand kW
  - Half hourly monitoring of electricity consumption
  - Monthly maximum demand kW
  - Monthly peak load kW (averaged over ½ hour period)
- Power factor
  - Electricity - Power Factor
  - Power Factor (PF) = True power (kW) / Apparent power (kVA)
  - Usually correct to PF 0.95 using capacitors
- Out of hours use
  - Establish kW power left on, Multiply by hours per annum premises unoccupied
  - Calculate % out of hours kWh use, £ saving, Calculate the potential £ savings through switch off
- Load factor
  - Load Factor (LF) = Consumption (kWh) / Max. Demand (kW) x hours



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### Understanding Your Energy Use

Two Stages :

- Simple audit of energy bills
- Find out where your energy goes

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### Why Survey ?

- Identify opportunities
- Energy strategy - proactive
- Focus on savings - not technology

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### What to Look for

Identify all major energy users and opportunities for improving energy

- boilers
- heating
- lighting
- water
- compressed air
- controls
- building fabric

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### When Should I Conduct an Energy Walk-round?

At different times of day and year as energy use changes  
For example:

- at lunchtime
- at night or during weekends
- when the cleaners are on duty
- beginning and end of heating season
- when clocks change

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### Energy Consumption/Cost

- Consider:
- Number of plant / item (No.)
- Rating (kW)
- Hours in use/required per day
- Days per year required
- Cost of utility (pence/kWh)

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### Four types of energy wastage

<b>UNNECESSARY</b> • Equipment and lights that are redundant	<b>POORLY CONTROLLED</b> • Timer and/or temperature controls wrongly set
<b>INEFFICIENT</b> • Poorly maintained boilers • Use of standard lamps instead of energy saving lamps	<b>INAPPROPRIATE</b> • Use of inappropriate fuels

Don't forget reducing energy is:

- Good for your bottom line environment
- Good for your company image
- Ready for future legislation

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### Energy Management Exercise


You survey your IT and find 20 PC's – none with energy saving features switched on. Typically they are left on in the evening and weekend. You estimate that on average each PC is actually being used 4 hours a day over 250 working days, the rest of the time they are left on. Electricity costs 10p/kWh (1000 W = 1kW).

Power consumption operating PC 100 W, Monitor 75 W

Power consumption idling PC 50 W, Monitor 10 W

Calculate:

- Existing costs
- Cost where PC and Monitors use idling or energy saving feature
- Cost where PC's and monitors are switched off through power down equipment or staff turn them off



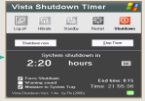

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### Answers

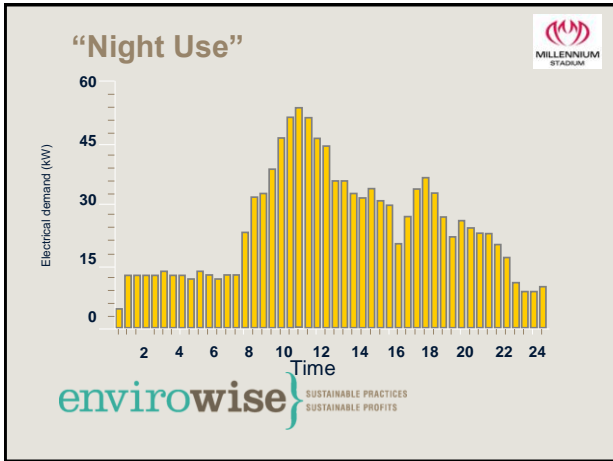
**Existing Cost**  
Load (100 W+75 W) x Hours (24 h x 365) = 1533 kWh per PC + Monitor  
With 20 units @ £0.10 / h = 1533 x 20 x 0.10 = **£3,066**

**Cost Using Idling or standby features**  
Load (100 W+75 W) x Hours (4 h x 250) = 175 kWh per PC + Monitor  
Idle (75 W+10 W) x Hours (24 x 365 – 1000) = 465.6 kWh  
With 20 units @ £0.10 / h = 175 x 20 x 0.10 + 465.6 x 20 x 0.10 = **£1,281**

**Cost with Monitors and PC's being turned off**  
Load (100 W+75 W) x Hours (4 h x 250) = 175 kWh per PC + Monitor  
With 20 units @ £0.10 / h = 175 x 20 x 0.10 = **£350**

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### Standby Energy Consumption

Equipment type	Average power consumption while in use (watts)	Standby energy consumption (watts)
PC (processor only)	40	20-30
PC monitors	80	10-15
Inkjet printer	40-80	20-30
Laser printer	90-130	20-30
Fax machine	30-40	10
Photocopiers	120-1000	30-250
Copy printers	160-200	35-50

**ACTION:**

- Adjust setups to ensure equipment enters standby mode when not in use
- Emphasis should still be placed on switching equipment off completely

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### Water Keep Alert – Look For ...

- Leaks
- Inappropriate use
- Water savings
- Tariff

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### Water Saving Devices & Practices

Cistern volume adjusters

- Cistern dam
- Dual flush
- Waterless toilets/urinals

Envirowise estimates that savings of £180 million / year could be made by companies in London if a displacement device is fitted to toilets used by each office worker.

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### Water Saving Devices & Practices

**Automatic taps**  
Savings 50% water use




**Spray taps**  
Savings 50% water use





### Water Saving Devices & Practices

**Flush control in toilets**

Savings 95% water use

Urinals operating without flush controls can use up to half of a company's 'domestic' water use. A company with 100 male employees could save £3,800 each year in water and sewerage costs – by fitting PIRs, a payback period of just five weeks.



### Implementing Water Saving Devices

Considerations

- Simple installation
- Easy to retrofit
- Use requires no training
- Negligible on-going costs




Talk to the Carbon Trust 0800 085 2005





### What a Waste

- What is Wrong Here?

At Home

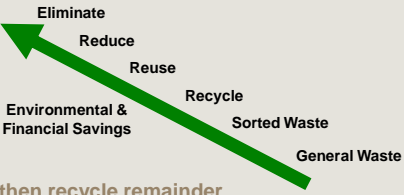


In the Workplace





### Why Recycle?

- Reduces resource and energy consumption
- Avoids impact of landfill and Landfill Tax currently set at £48 rising to £56 next April



• Minimize first then recycle remainder



### Paper - Reuse and Recycle

- New paper and cardboard products
- Tissue products
- Moulded packaging
- Cellulose insulation
- Hydro-seeding mulch
- Building products
- Compost bulking agent
- Animal bedding
- MDF Products




5 million tonnes of waste paper are still sent to landfill or incineration each year



### Glass – Reuse and Recycle



- Container Manufacture
- Glass-fibre insulation
- Blasting abrasive
- Abrasive wheel manufacture
- On-site water filter medium
- Textured wall coatings
- Golf course sand
- Concrete paving
- Aquarium gravel
- Cement block filler
- Tile manufacturing
- Construction aggregate
- Asphalt



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Currently we landfill around 1,400,000 tonnes of glass each year.

### Plastics – Reuse and recycle



- Buckets, containers
- Lumber (profile extrusion)
- Film (eg. grocery bags)
- Injection moulded parts
- Structural foam
- Drainage pipe, Traffic cones
- Safety fencing
- Wood / plastic composites
- Thermoformed parts
- Soda bottles
- Boat hulls & car parts
- Landfill liners,
- Polyester fibre & fabric, stuffing for ski jackets, Carpets, strapping, twine



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The amount of plastic waste generated annually in the UK is estimated to be nearly 3 million tonnes and only 7% of total plastic waste arisings are currently being recycled.

### Basic Recycling



- Staff are familiar with domestic recycling / composting
- Workplaces now routinely recycle:
  - Office paper
  - Cardboard packaging
  - Drinks cans
  - Plastic cups and bottles
- But,.....
- Poor understanding of further opportunities
- Little knowledge of the value of recyclates
- Poor understanding of the scale of environmental benefits



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### How To Improve Recycling



- Apply sustainable procurement policies
  - Demand recyclable packaging or take back scheme
  - Specify recycled content
- Determine the value of your recyclable waste
  - Market values for collected and delivered (you do not need waste carriers licence if you are the producer)
- Get the best from your current waste contractor
  - Ask for information on their full range of recycling services
  - Seek good data on waste vs recycling from your sites
- Investigate alternative waste contractors
  - <http://wastedirectory.netregs.gov.uk/>



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### How To Improve Recycling – it can be hard work!




**Example: What to do with 30t of leather scrap currently sent to landfill?**

- Substitute leather for alternative (it is sustainable but not "green") and replace it with the eco leathers and return all cuttings to the supplier for re-manufacture (even the packaging) - but what about the product, cost and customer?
- They could source companies that uses leather (if it is chromium free) - e.g. those producing for Biome (bags, book covers etc), Torly, Eco Domo (Leather floors), Glove and Apron companies etc - but these will be based abroad - cost?.
- Are there local / UK manufacturer's that could use the leather - research?
- France and Italy both have recycling companies that collect leather scrap internationally and ship to the Far East - at a cost? A local waste contractor could collect and supply the waste to these groups - cost?
- Leather can be composted - depending on the tanning process - what is available locally - if PAS 100 unlikely to take it ?
- Leather can also be used in a waste to energy gasification plant (leather has 20 MJ/ kg) - it cannot be openly burned due to the chromium. – feasibility?


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### Your actions matter!



- You should have systems to reduce the impact on the environment
- These are only as good as the way they are used by you
- Consider the environment and the bigger picture by reducing raw material use, water and energy
- Where you can't reduce consider reuse and recycling where possible
- We all can make a contribution.

• What's your first idea ? .....



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