Green Design

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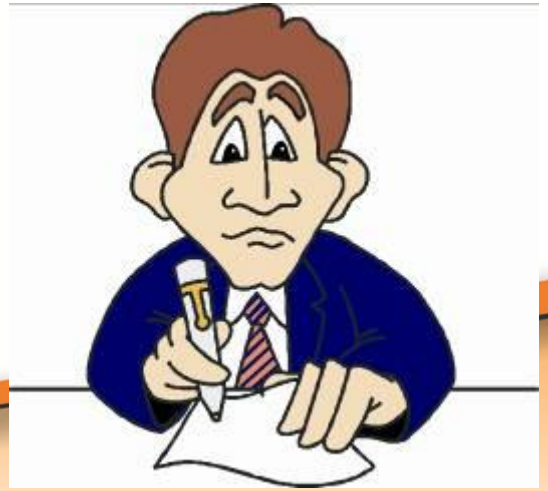
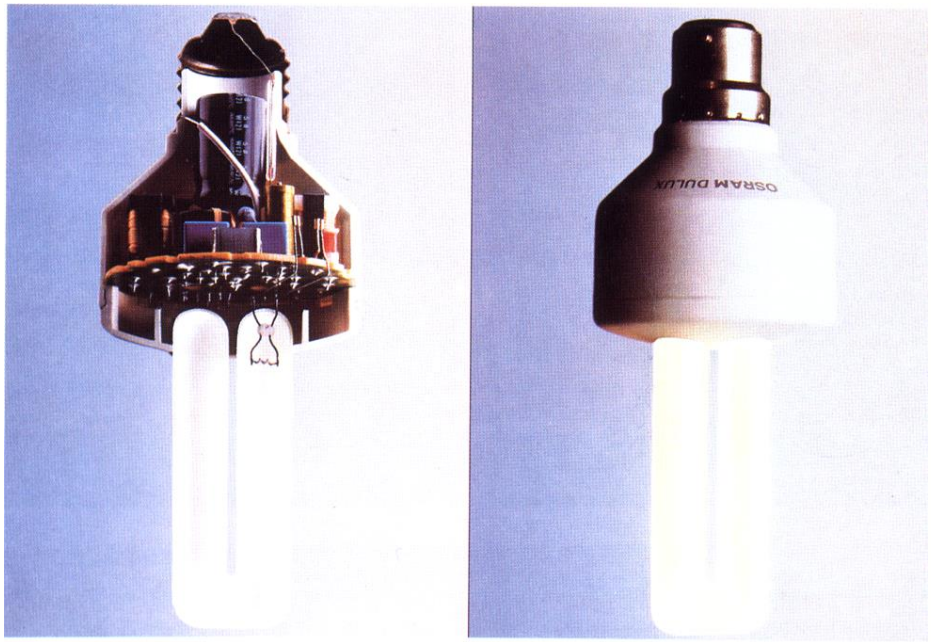
Exam expectations

Green Design and sustainability issues are regularly tested in the written paper.



What is Green Design?



What are the issues?

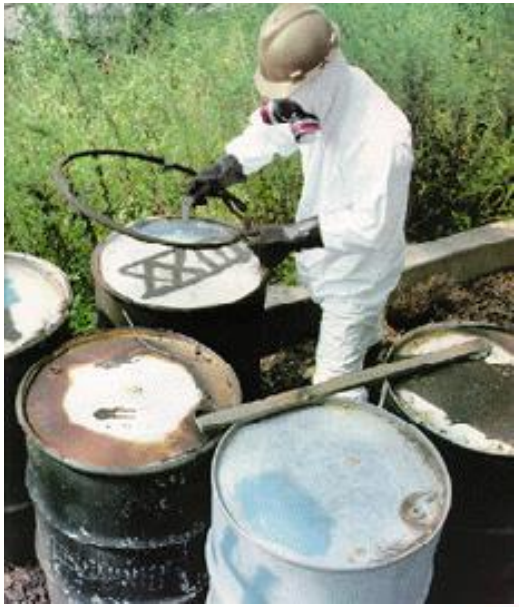
Is this a marketing ploy or are we really taking this seriously?

Environmental concerns

The impact our lifestyle is having upon the environment has to be adjusted as a matter of urgency

Manufacturing waste

- All manufacturing produces some form of pollution
- Is that always going to be the case?
- Is there a better way?



Sustainability

All our resources come from one place

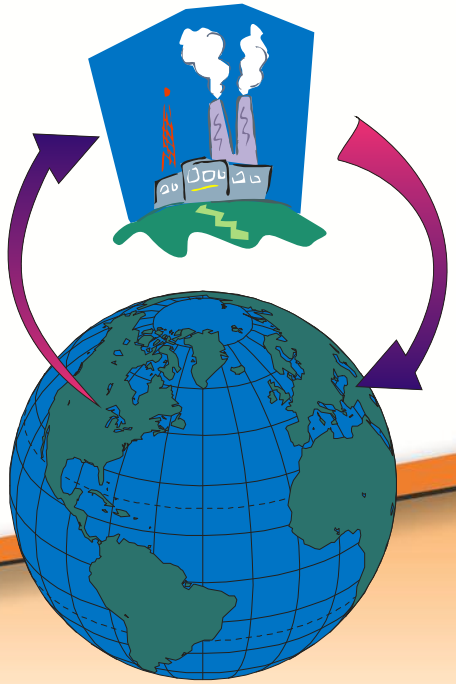
Food, energy, materials, chemicals

Sustainability

The problem is, in the UK we are currently the using the resources as if we have 3 of these!

Sustainability

- Can we continue to produce products which consume large amounts of energy and material resources?
- What changes are needed?
- Is it possible to have products which create no negative environmental impact?



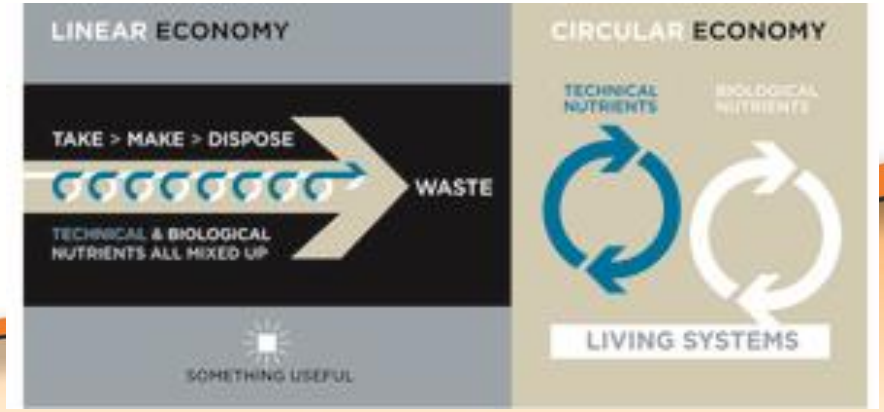
Key requirements for sustainability

- Use resources carefully
- Avoid solving your problem if you create another problem for someone else
- Improve your environment – do not damage

Plant filled air purifiers

The Circular Economy

- This is a new way of thinking which suggests that we should follow nature's model
- Often known as the closed-loop system many believe that it is possible to make products that actually make the environment better rather than "less bad"
- Check out the Ellen Macarthur Foundation website http://www.ellenmacarthurfoundation.org/about/circular-economy



The “6 Rs”

- **Recycle** and reprocess the materials
- **Re-use** materials/components/products for another purpose
- **Reduce** the amount of energy and resources used throughout the whole product life cycle
- **Repair** products/design them to be easily repaired
- **Rethink** our current lifestyles and the way we design and make
- **Refuse** products which are unnecessary or wastefully use resources

Recycling

- **Collect** products
- **Separate** into components
- **Sort** into separate material groups

Labelling materials

- Many products are labelled to show the material they are made from

Potential for re-using

Expensive materials/components can be reused to create new products

Alternative Energy

Ways of generating power for the products we use....

Solar power

Clockwork

Fuel cells

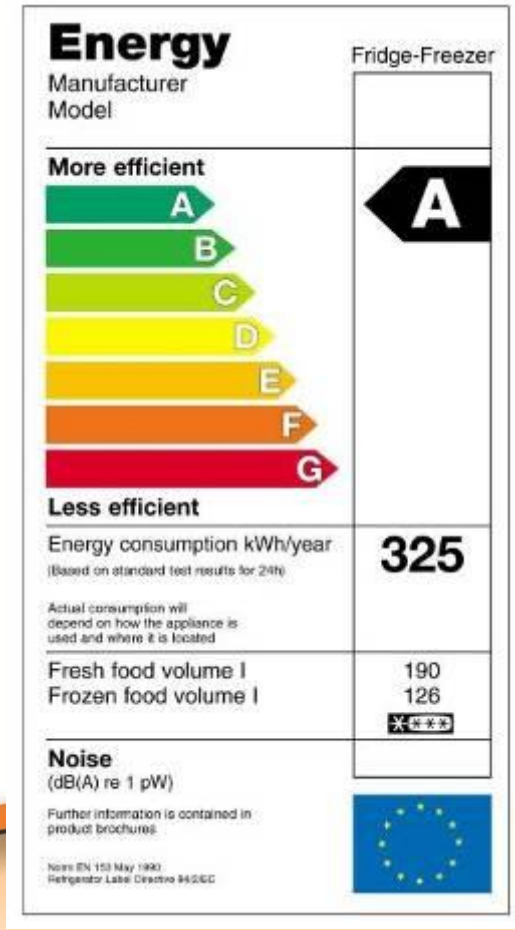
Wind power

Why Conserve?

- Save energy
- Half a can of petrol saved every time an aluminium can is recycled.
- Every time an old part is reused, the cost of producing a new one is saved.
- New BMW models are over 80% recyclable.
- Efficient engines can produce high outputs.

Energy efficiency

- More information for customers
- Each product has to meet a set of criteria to get Energy Saving Recommended status. The idea is that whatever the product, whichever the labelling system - all you need to do is look for the Energy Saving Recommended logo.



Energy efficiency

- Incandescent bulbs use a very old lighting technology in which 80% of the energy used is turned into heat and only 20% is converted into light thus making our electricity bills higher with less lighting effect in our homes, offices, and businesses.

Energy efficiency

- Originally known as an energy-saver lamp, a compact fluorescent lamp or CFL is designed as an energy-efficient, long-lasting substitute for the standard incandescent bulb. In a more compact form, it uses the same principle of the fluorescent tube in which a phosphor coating transforms some of the ultraviolet energy generated by the discharge into light.
- They use around a quarter to a fifth of the electricity used by an ordinary light bulb.
- CFLs use mercury which is harmful!

Energy efficiency

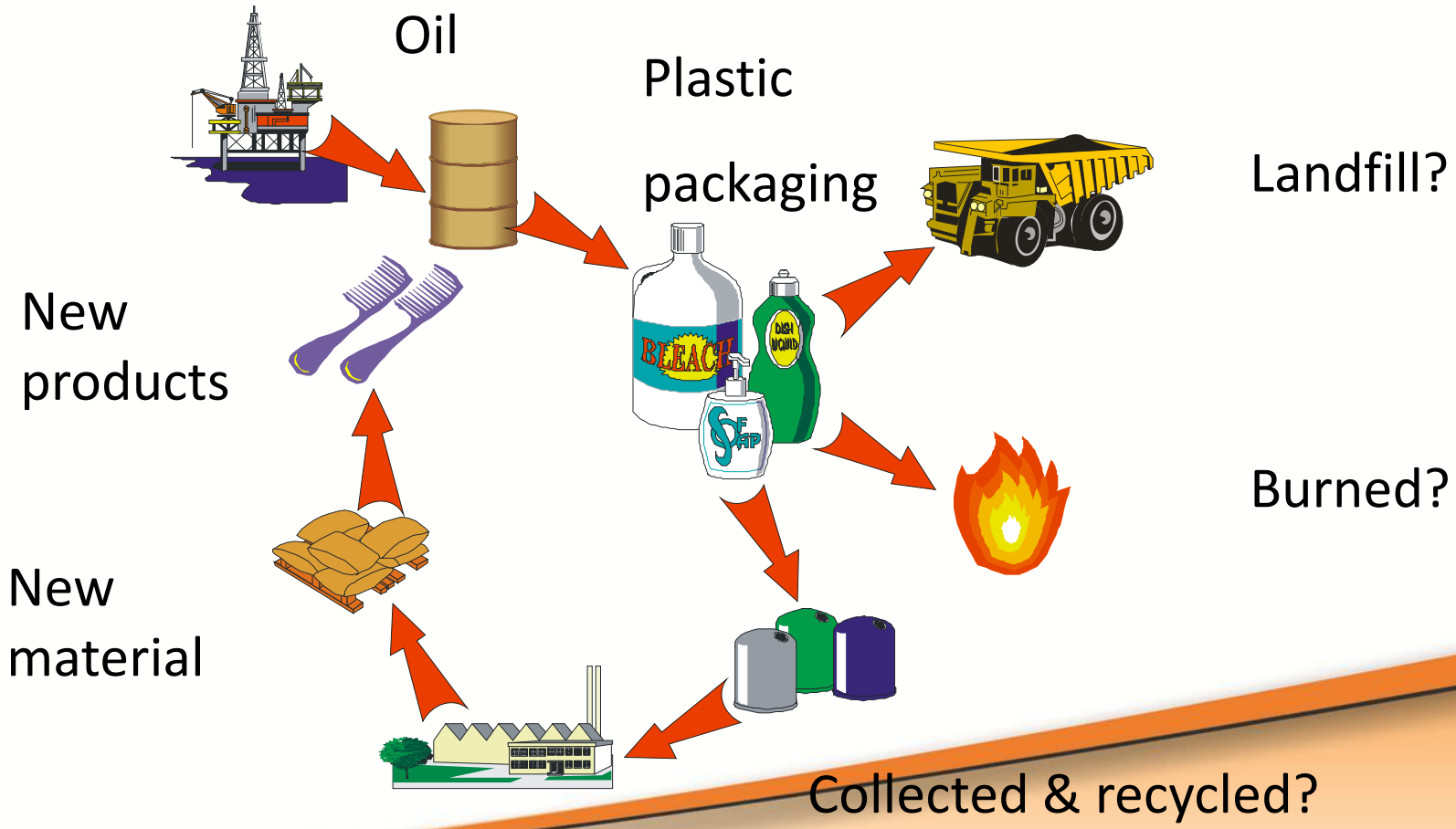
- LEDs are more efficient than both incandescent and fluorescent light sources and use approximately 10% of the energy of an incandescent and 25% of the energy consumed by a fluorescent fitting.
- There is a minimal amount of heat produced by LEDs as the energy is converted to light efficiently. Typically an LED light source will last approximately 50,000 hours when used in normal operation. LEDs are solid state devices that are not sensitive to vibration like conventional lighting methods. LEDs provide numerous colour options and colour control unlike conventional and fluorescent sources.

Water bottles

- Refillable water bottles
- Every year over 50 billion plastic water bottles are sent to landfill in this country
- Potential to save on tons of unnecessary plastic bottles manufactured each year
- Manufactured by Sigg

Cradle to grave

Materials stay with us in some form forever.....



Product Life Cycle

- How is raw material extracted?
- Use of vast amounts of energy to process and manufacture.
- May create harmful waste
- Product then has to distributed
- The effects of products being used
- Disposal after useful life is over

Disposal – who pays?

Tyre dumps…
Fridge dumps...

Many products require expensive disposal methods. Should the product manufacturers be responsible for this?

What would the world be like if manufacturers had to reprocess the materials?

Eliminate waste

- The biological and technical component parts of any product should be designed for disassembly and re-processing.
- The biological parts are non-toxic and can be simply composted.
- The technical parts, polymers, alloys and other man-made materials are designed to be used again with minimal energy usage.

ELLEN MACARTHUR FOUNDATION
Rethink the future

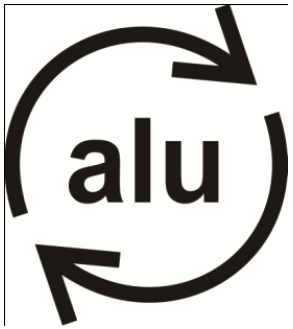
New symbols for disposal

- **Green Dot** – fee has been paid to recover packaging in some European countries. This claim has little environmental significance but should it be the norm?

- **Disposal of Waste Equipment by Users in Private Households in EU**. This simply means consumers should be responsible to disposing of the product at a recycling centre. Should it be taken back to the retailer? Should they collect and return to manufacturers?

Environmental labelling

Recycling symbol



Specific Material Information

Composite/combined materials

- Can use far less material but generally are harder to recycle
- Should we discourage this or develop better ways to separate the materials for re-processing?
- Some manufacturers claim that their composite/combined materials are actually more environmentally friendly as they use less materials and less energy to transport them.

Biodegradable

- Compostable
- Organic
- Is this better?
- Can these materials improve the environment?

Rain forests

- Slow growing hardwoods
- On average 27 trees damaged/destroyed for each one cut for timber
- Harder to renew
- Destruction of local habitats
- Land erosion is common
- Is there a better way?

Managed forests

- Often planted as a crop – fast growing softwood
- Easy access
- Renewable material
- Natural rainforests can also be well managed to ensure they are protected even though timber is removed.

THE RAINFOREST FOUNDATION
SECURING LANDS, SUSTAINING LIVES

The Forest Stewardship Council

- Demands by consumers for sustainable timber has led to many different labels on forest products, making claims such as 'for every tree felled at least two are planted.'
- Many of these claims are irrelevant or misleading. A study by WWF found that of a sample of 80 different environmental claims found on wood and paper products, only three could even by partly confirmed.
- The FSC aims to clear up the confusion by introducing a labelling scheme for products from well-managed forests. The logo provides the consumer with a guarantee that the products have come from a forest which has been evaluated and certified as being managed according to agreed social, economically viable and environmental standards.

FSC

Materials from animals

- Grown specifically for the materials they produce
- Renewable resources
- Does nature offer the opportunity to create new materials in the future?

Materials from plants

- Grown for the materials – cotton, timber, wood pulp, cellulose, fibres etc.
- Renewable resources
- New materials are being developed to replace oil-based polymers

Compostable tableware

PAPCoRN are two industrial designer who work with materials which are compostable. They work with the latest plastics, which are based on renewable resources such as wheat, maize and lactic acid. All these products have a limited environmental impact, from beginning to end and form part of nature's own cycle. They aim to combine good design with a vision of reducing environmental damage

Spud forks

- Made from 80% potato starch, 20% Soya oil.
- Can be washed in dishwasher
- Totally biodegradable in just 180 days!
- Made by SpudWare

Pesticides and fertilisers

- Just because the materials come from plants does not necessarily make them environmentally friendly.
- Cotton has a bad record as far as pesticides and fertilisers are concerned.
- Look for “organic” cotton products.

Materials from the earth

- Finite resources (when they are gone they are gone)
- Non-renewable materials
- We must recycle these materials whenever possible
- Should they go back to the manufacturers for reprocessing?

Materials from oil

- Finite resources
- Non-renewable materials
- Must recycle these materials whenever possible
- Should they go back to the manufacturers for reprocessing?

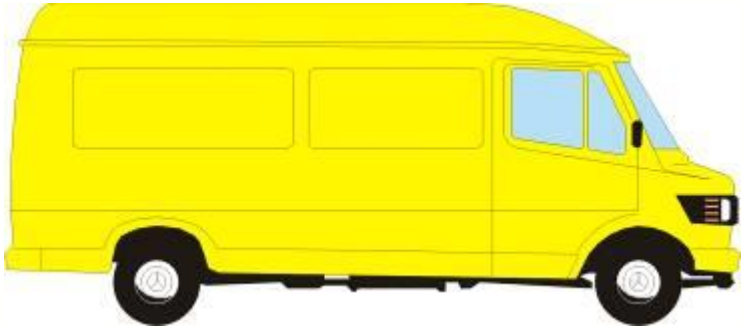
Carbon Footprint

- A measure of the impact human activities have on the environment in terms of the amount of green house gases produced, measured in units of carbon dioxide
- Some people believe that it is not enough to reduce our carbon footprint we should actually improve the environment by creating oxygen.

Product miles

How many miles does the product travel?

- Source material to primary processor
- Material to factory
- Product to distributor
- Distributor to retail outlet
- Retail outlet to home



How much energy is consumed just through transporting materials, components and products?

Can we dramatically reduce this?

Social responsibility

"Designed obsolescence is no longer acceptable."

Victor Papaneck (1970)

Lots of products are still designed for a very limited life span

Some are designed to be disposable

Some are outdated as soon as they hit the High Street

IKEA

- The world's largest furniture manufacturer
- By some measures it is suggested that they are the third largest consumers of timber in the world
- They manufacture products for a very short life span
- They claim to be environmental friendly
- Can that be the case?

IKEA’s claim

- IKEA claim that their policy of manufacturing flat-pack furniture is sustainable.
- They can transport more furniture from factory to store at a time, reducing the level of emissions generated.
- Corrugated cardboard packaging, the company suggests, makes the products cheaper and is environmentally friendly.
- The minimalist, lightweight designs the company has pioneered mean that less materials are used in the fabrication of each item of furniture, while again reducing the energy and emissions involved in transporting them.

IKEA's claim

- Timber is purchased from sustainable sources
- Getting you to assemble the furniture at home again cuts emissions - by reducing the number of automated assembly lines IKEA uses - while lowering the cost of the furniture.
- Check out IKEA's 2010 Sustainability Report and make your own mind up http://www.ikea.com/gb/en/about_ikea/newsitem/sustainability_report

Fair Trade

- The FAIRTRADE Mark is an independent consumer label which appears on products as an independent guarantee that disadvantaged producers in the developing world are getting a better deal.
- They receive a minimum price that covers the cost of sustainable production and an extra premium that is invested in social or economic development projects.

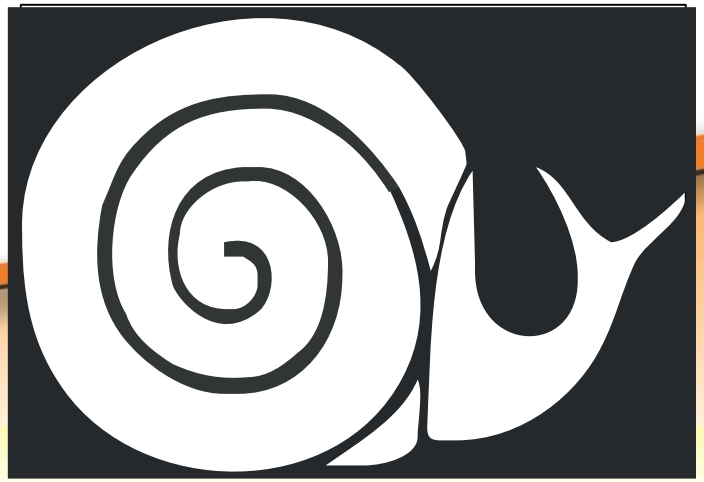
Traidcraft

- Traidcraft is the UK’s leading fair trade organisation. Their mission is to fight poverty through trade, practising and promoting approaches to trade that help poor people in developing countries transform their lives.
- Traidcraft's unique structure - a trading company and a development charity working together - gives them a distinctive perspective on how trade can be made to work for the poor.

TRAIDCRAFT
Fighting poverty through trade

Slow Food Movement

- Slow Food is **good**, **clean** and **fair** food.
- This international movement believes that the food we eat should taste good; that it should be produced in a clean way that does not harm the environment, animal welfare or our health; and that food producers should receive fair compensation for their work.



Social responsibility

- Environmental problems
- Power of your vote
- New legislation
- Sustainable rather than uncontrolled development.

Check out products before you purchase.

You have the power to change things. It is your future!

What is Good Design?

- Increased product life
- Energy efficient
- More durable
- Easy to repair
- Easy to recycle
- Sustainable
- Improves the environment

Solar gadget charger

- The Brunton SolarRoll is easily transported and allows you to unroll where there is a little sunlight and recharge a wide range of products

Solar powered watch

- Citizen’s solar powered Eco Drive watches make you wonder why all watches are not solar powered!

Freeplay companion

- Combination of solar powered and clockwork generation
- Radio and torch and just over 120mm long
- Can also recharge your phone!

Zero power on standby

- We are all aware of the “standby power” problem which wastes such vast amounts of energy.
- Fujitsu Siemens have developed a monitor which uses zero standby power.

Bath settee

- Reestore attempts to “avoid traditional eco materials in favour of contemporary finishes, fabrics, and, above all, style”
- Constructed from a recycled bath

Washer table

- Another Reestore product
- Constructed from recycled washer drum with a polished glass top.

Blanket rug

- Tejo Remy and Rene VeenHuizen have produced this stunning rug
- Made from recycled blankets

Solar powered car

- Featured at the World Solar Challenge 2007
- 70km/hr
- Zero emissions

Solar electric bus

- In use in the city of Adelaide in Australia
- 200km between charges
- Up to 42 passengers
- Fully carbon neutral
- Free to ride!

ZiPEE electric scooter

- **Z**ero **I**nput of **P**ollution from **E**missions into the **E**nvironment
- Designed for use in London and other cities

Three wheeled hybrid vehicle

- The Venture One is a stylish two passenger vehicle
- Capable of 100mph
- Flex-fuel hybrid motor
- Fully electric version planned

Electric sports car

- The i-MIEV Sport by Mitsubishi
- Interior uses plant-based resin technology which they claim is environmentally friendly
- 100 miles between re-charges

Remember….

Just because it is green doesn’t mean it has to be boring!

It’s your future!