how to live a low-carbon life

Adam Trickett

Links and Slides

http://www.overton-biodiversity.org/

http://www.iredale.net/

http://www.slideshare.net/

~ ❖ ~

How to Live a Low-carbon Life:

The Individual's Guide to Stopping Climate Change

by Chris Goodall.

Earthscan Publications Ltd, 8 Feb 2007, ISBN 1844074269.

Not Talking About

- Green house effect
- Global warming
- Climate change
- Peak oil

Or

- Nuclear power
- Clean coal
- Carbon capture
- Offsetting

I Am Going To Talk About

- Personal carbon footprint
- Sustainable carbon footprint
- How to get from today to tomorrow

Carbon Footprint

- Estimate of your personal carbon dioxide emissions
- Includes other green-house gasses as CO_2 equivalents
- Can be estimated many different ways

Question?

What is the average UK carbon footprint per person per year?

Answer

About 12 tonnes!

What is Sustainable?

About 3 tonnes...

A Reduction Of

75% or 9 tonnes

more detail

The Worst Offenders

Source of Pollution	Today	Tomorrow
Food	2.1	0.7
Air Travel	1.8	0.0
Car Travel	1.2	0.9
Space Heating	1.2	0.9
Everything Else	6.2	0.5
Total	**12.5**	**3.0**

Typical UK per person, per annum, carbon footprint in tonnes and desired sustainable level.

Money = Power = Carbon Dioxide

£ = kW h = CO_2


GoodPlanet.org

Tactics

- Free and easy
- Cheap and cheerful
- Costly and longer term


WASTE!


WASTE!


WASTE!


WASTE!


WASTE!

more detail

Cut Out Waste

- Smart power-strips, one off, all off
- Close your curtains when it gets dark
- Wash your clothes in cool water, 30C is fine
- Compost what you can – it produces less methane than landfill
- Don't use your car when you can walk
- Set your fridge to the correct temperature

Cheap and Cheerful

- DIY
- Shouldn't cost much
- Quick pay back
- A bit of planning


Roof 25%
Windows 10%
Walls 35%
Draughts 15%
WASTE!
Floor 15%

Keeping Energy In

- Loft insulation
- Wall insulation
- Draught exclusion
- Pipe and tank lagging


WASTE!


LIGHTWAY
MD 11034
8W 60mA
220-240V~50/60Hz
Nicht Dimmbar
SAVE
IT

Energy

Washing machine

Manufacturer
Model

More efficient

A
B
C
D
E
F
G

Less efficient

B

Energy consumption kWh/cycle (based on standard test results for 60°C cotton cycle) Actual energy consumption will depend on how the appliance is used	**1.75**
Washing performance A: higher G: lower	**A** B C D E F G
Spin drying performance A: higher G: lower	A **B** C D E F G
Spin speed (rpm)	1400
Capacity (cotton) kg	5.0
Water consumption	5.5
Noise (dB(A) re 1 pW) Washing	5.2
Spinning	7.6

Further information contained in product brochure

energytariff.co.uk


Salisbury
159001

The Rs

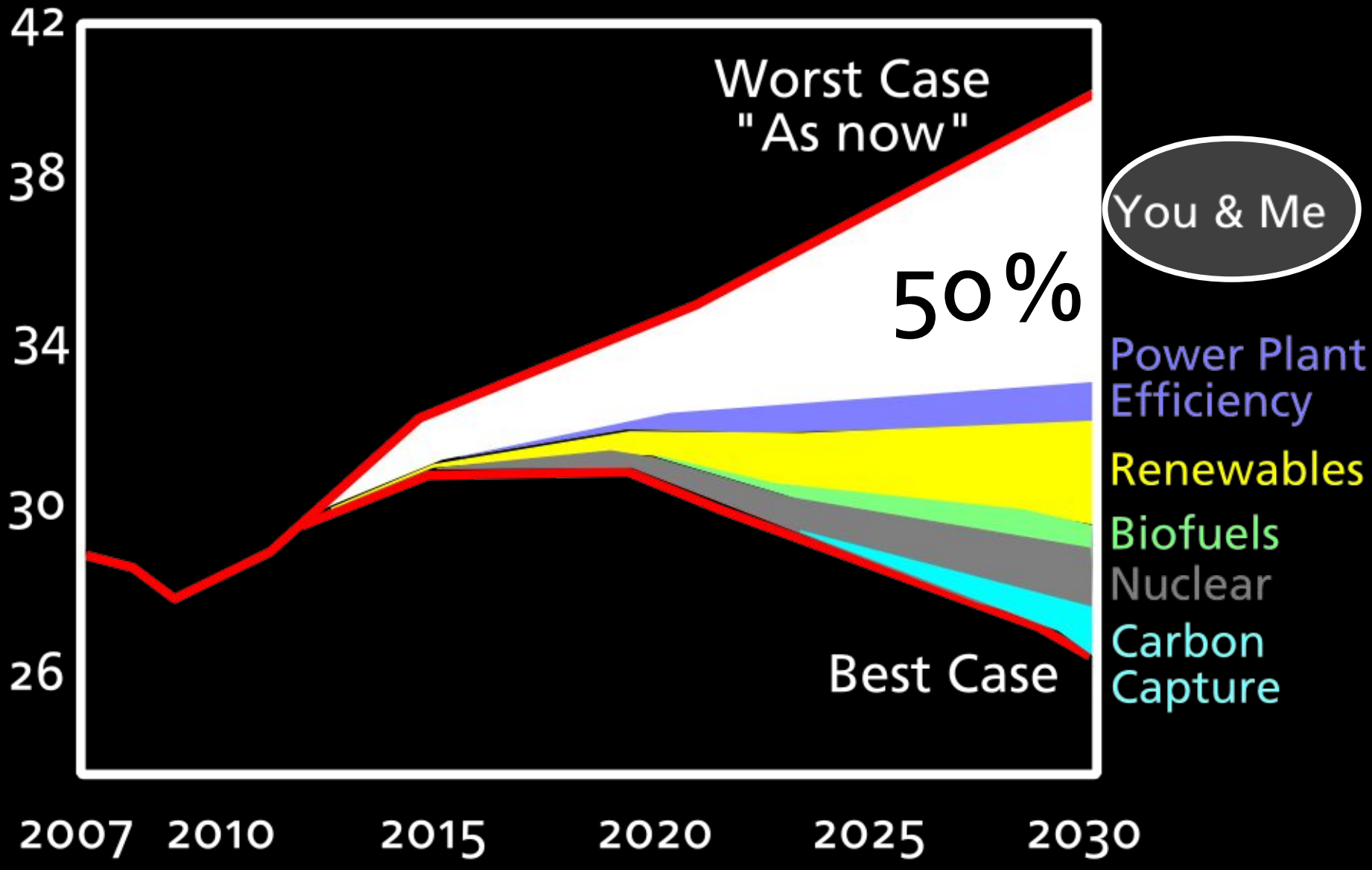
- Reduce
- Rate
- Repair
- Reuse
- Recycle
- Responsible


BRITISH AIRWAYS


IB-64-61

why?

UK Emissions (billions of tonnes CO_2)



Source: IEA

reduce

reduce

reduce

reduce

www.1010uk.org

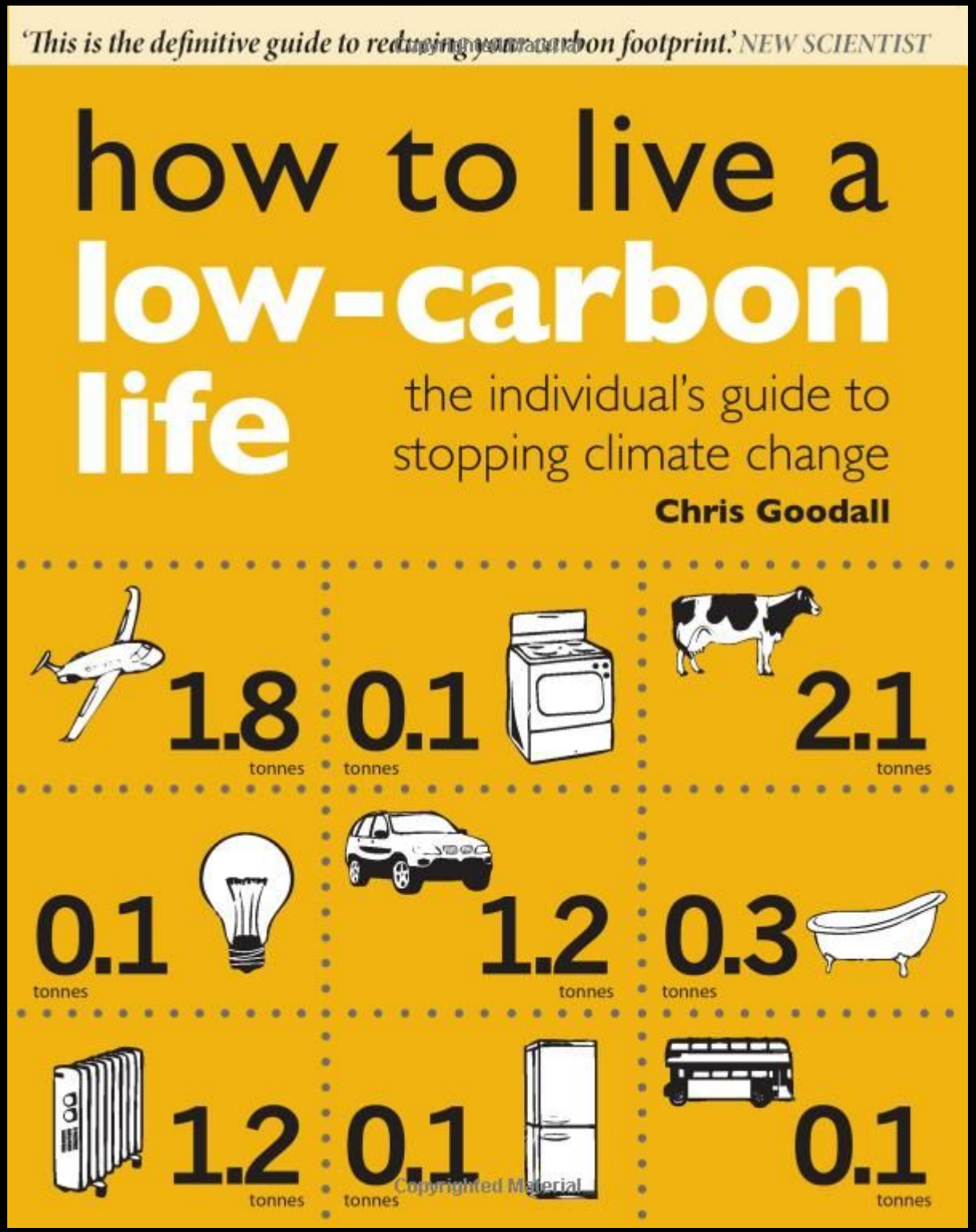
Some 10:10 Ideas

New boiler if old one is over a decade old	0.3	Better food buying and no waste	0.2
Cavity wall insulation	0.3	No processed foods or ready meals	0.2
More loft insulation and draught proofing	0.2	Vegan three days per week	**0.5**
Lower thermostat by 1C	0.2	Buy 50% "pre-owned" clothes	0.3
Get rid of the second car	**0.7**	Buy "pre-owned" mobile phone, recycle electronic kit	0.3
Replace your car with a band A or B manual diesel	**0.5**	Keep electrical devices 1 year longer than normal	0.2
Learn to eco-drive	0.2	Read on-line, from the library, or second hand	0.2
Stop flying	**1.2**	Block junk mail, get electronic billing	0.1
Only one short haul flight per year	0.3	Cycle everywhere	0.3
Largely vegetarian diet of local unprocessed foods	**0.5**	Work from home (saving over train!)	0.1

Savings in tonnes per annum, based on UK average usage. 10% of 12 tonnes is 1.2 tonnes.

Thank You

Any Questions?


'This is the definitive guide to reducing your carbon footprint.' NEW SCIENTIST
how to live a
low-carbon
life
the individual's guide to
stopping climate change
Chris Goodall
1.8 tonnes
0.1 tonnes
2.1 tonnes
0.1 tonnes
1.2 tonnes
0.3 tonnes
1.2 tonnes
0.1 tonnes
0.1 tonnes
Copyrighted Material

Appendix A

www.est.org.uk

www.environmentcentre.com

www.lowcarbonlife.net

www.carboncommentary.com

www.1010uk.org

www.lovefoodhatewaste.com

actonco2.direct.gov.uk

back

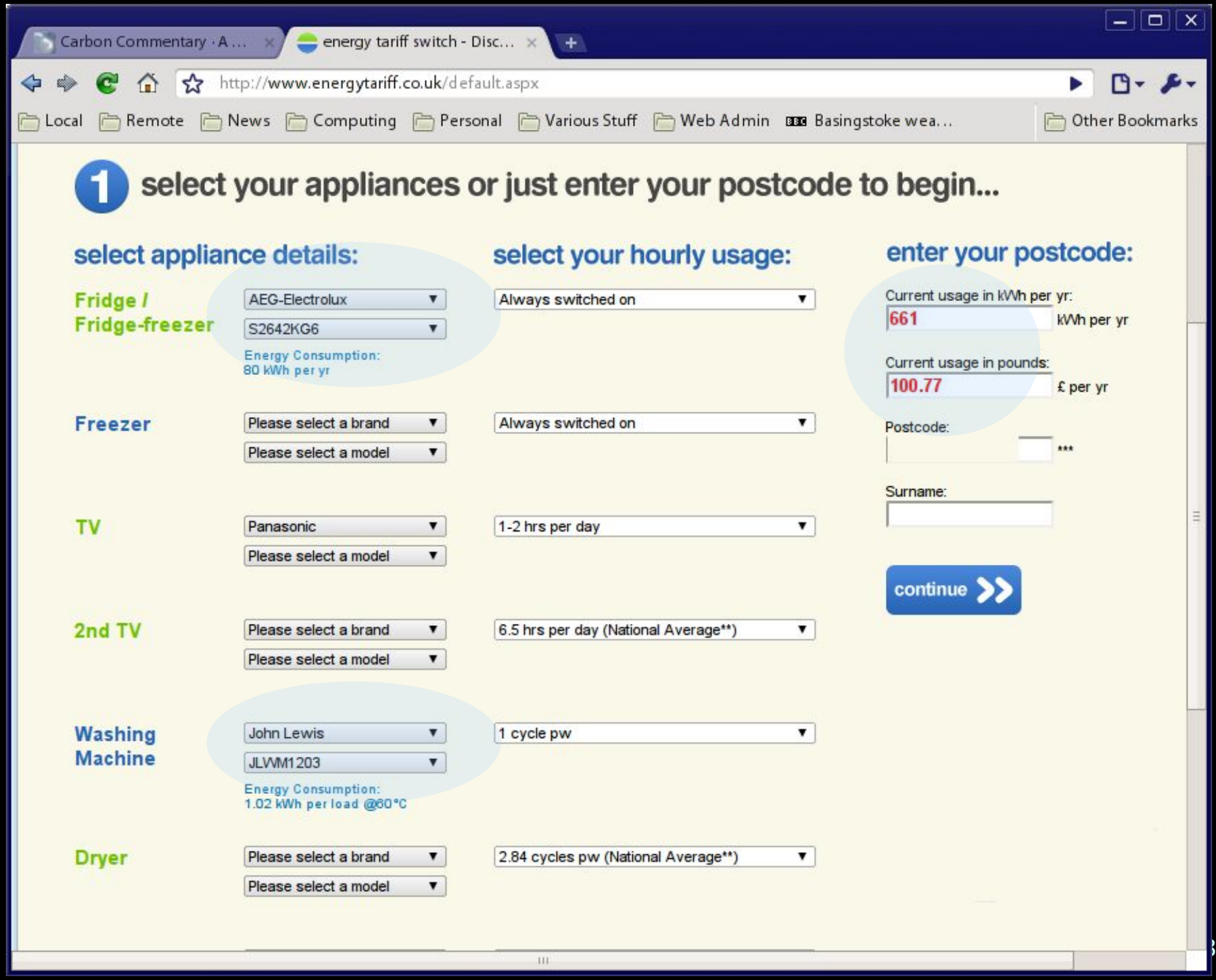
Appendix B

Source of Pollution	Today	Tomorrow
Other Indirect	4.4	-1.3
Food	2.1	0.7
Air Travel	1.8	0.0
Car Travel	1.2	0.9
Space Heating	1.2	0.9
Other Direct	0.6	0.3
Household Appliances	0.6	0.4
Water Heating	0.3	0.2
Public Transport	0.1	0.1
Home Lighting	0.1	<0.1
Gas Cooking	0.1	<0.1
Total	**12.5**	**3.0**

Appendix C

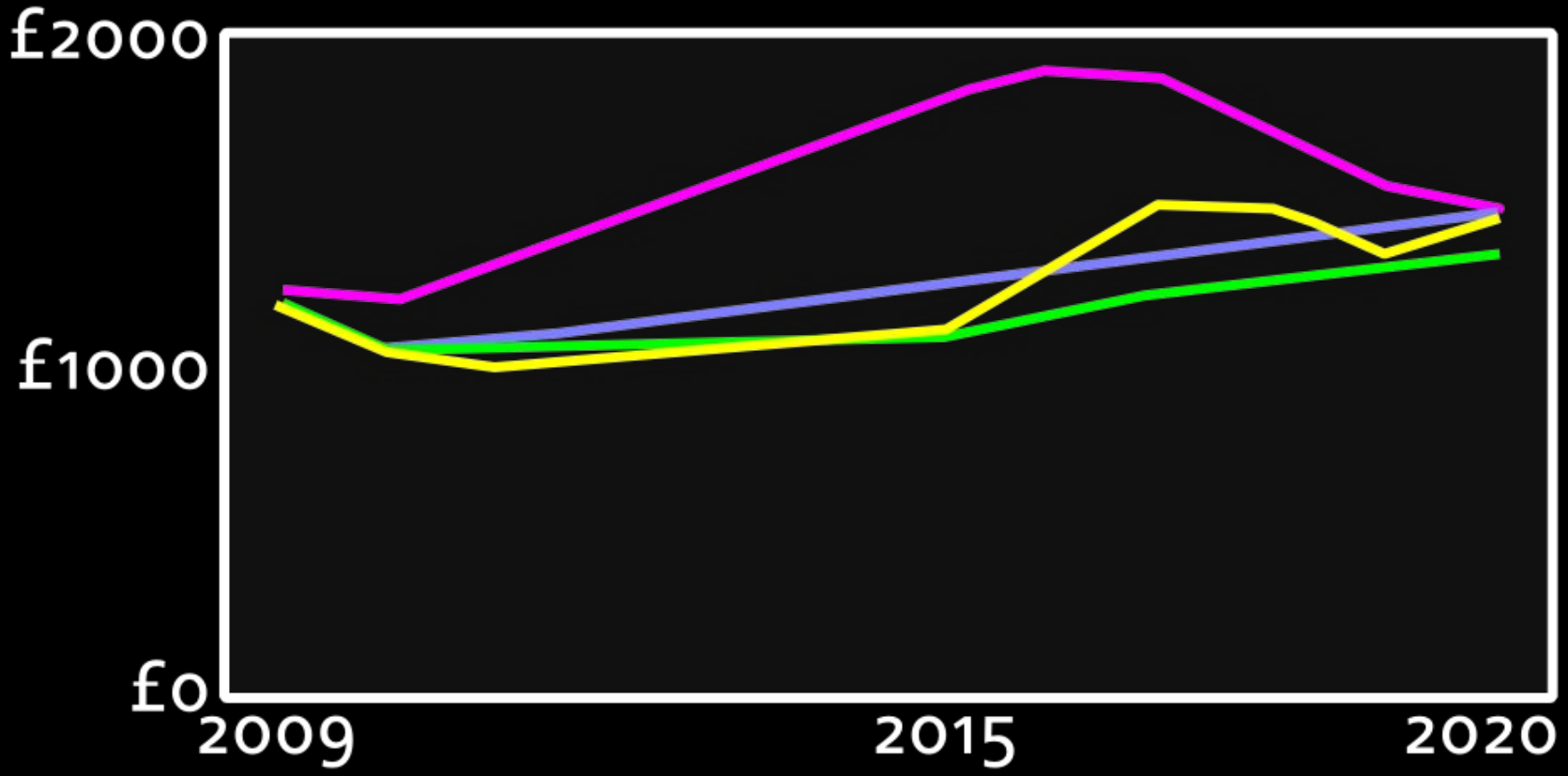
- Only boil water you intend to drink
- Only heat rooms you are in
- Turn something off you aren't using
- Shower not bath
- Only buy food you will eat
- Wash in less and cooler water
- Choose low packaged goods

back



www.energytariff.co.uk

Average UK Domestic Consumer Bill



Dash For Energy

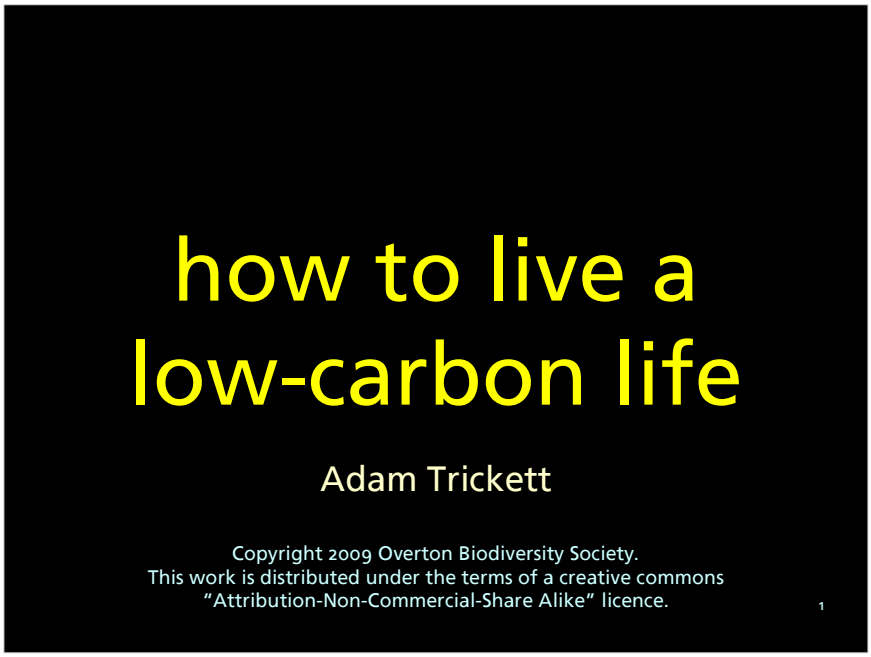
Slow Growth

Green Transition

Green Stimulus

Source: OFGEM

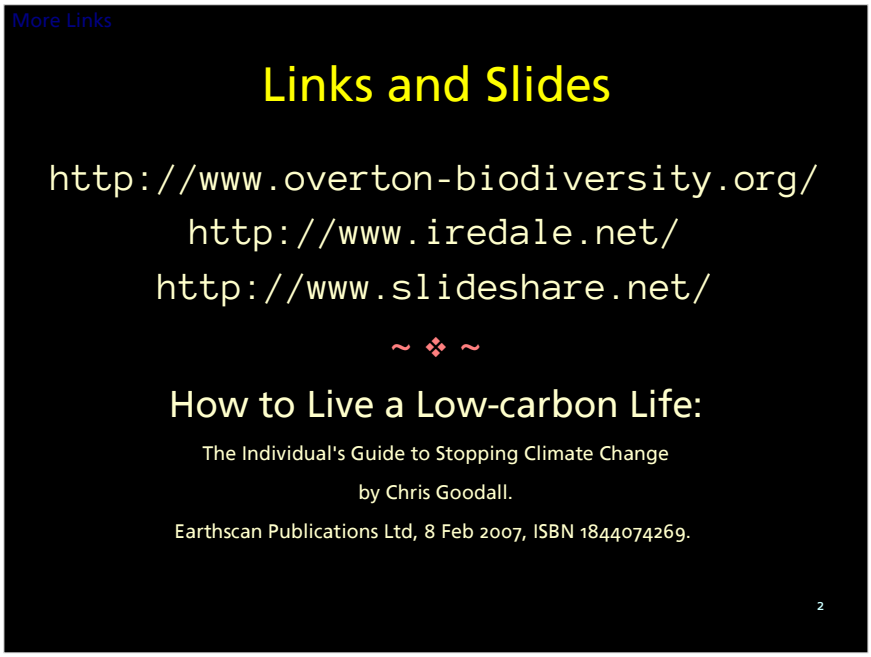
back



Hello!

Please note that if you want a copy of these slides or to use them yourself you are more than welcome to have a copy as they are distributed under a Creative Commons, "Attribution-Non-Commercial-Share Alike" licence.

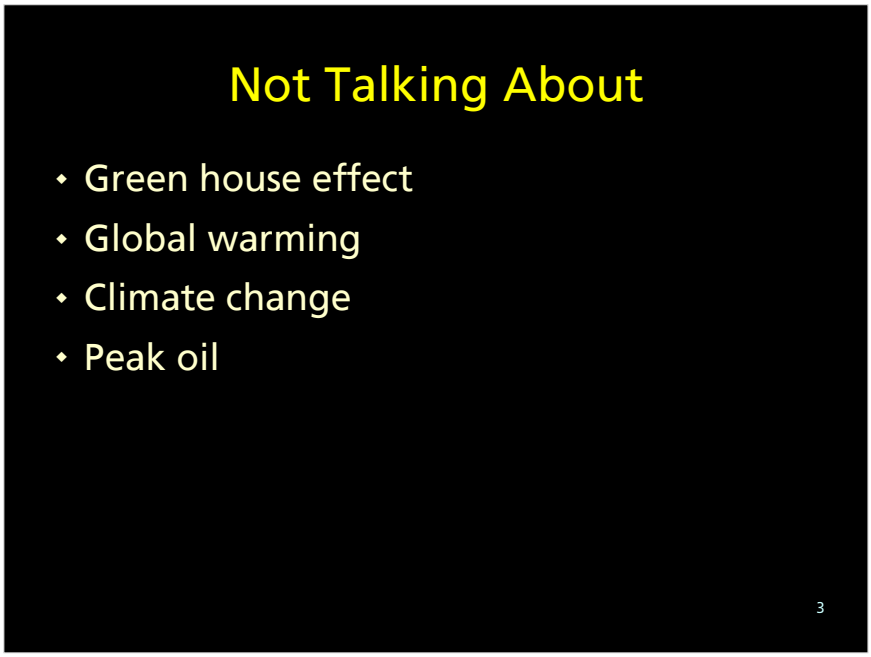
If you have any questions pleas ask them as we go along.



These slides can be downloaded along with the notes from any of these sites. The OBS, my site and from slide share.

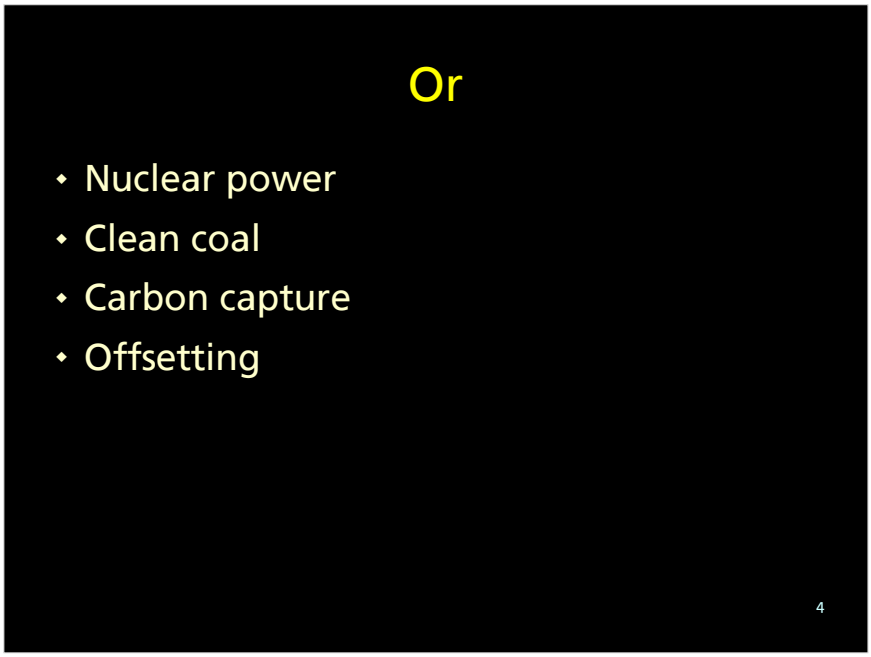
The notes contain additional data and references if you want them.

I'd also suggest getting Chris' most excellent book, on which most of this talk is based.



I'll first of start by making it clear what I'm not talking about.

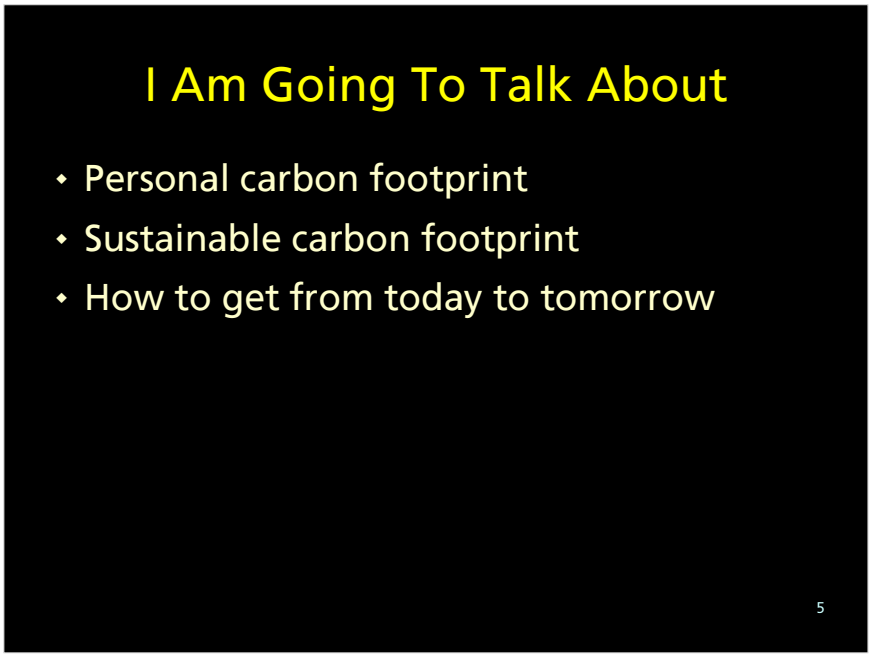
I'm assuming everyone knows about these points and understands that it's only be reducing our CO_2 output that we are going to make a difference.



I'm also not going to talk about these “heavy” industrial options.

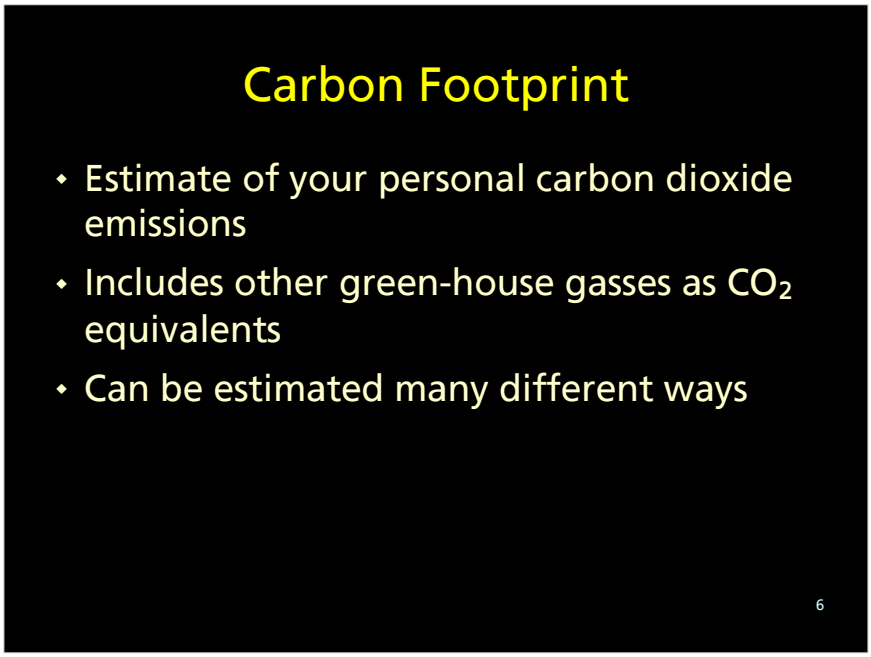
I'm only going to talk about things than can be done on a personal scale.

I have an opinion about these topics and others and you can ask me about them after the talk – but they are just my opinions!



Okay, so what am I going to talk about?

Basically I'm going to explain what a carbon footprint is, what a typical UK carbon footprint value would be. What we believe a sustainable level should be and most importantly how to get from where we are today to where we need to be.



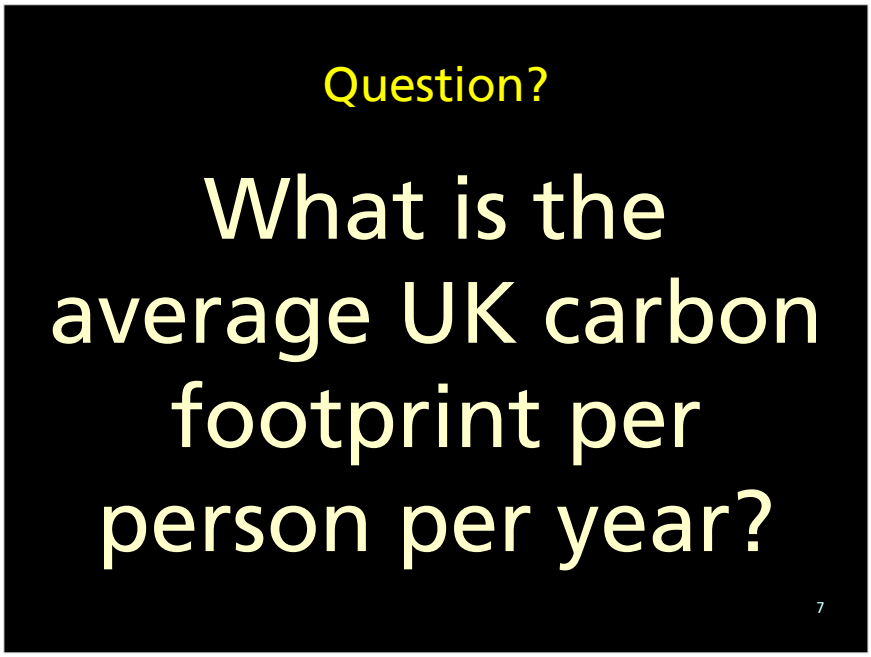
"Carbon Footprint" is a nice way of saying carbon dioxide pollution. Sounds nicer than sewage, rubbish, toxic waste doesn't it?

Remember that there are lots of other pollutants that are even worse than CO2, such as oxides of nitrogen and methane – that are some times included and sometimes not included in the quoted figure.

There are lots of ways of estimating your CO2 foot print don't be surprised if you get lots of different estimates from the same inputs!

Here are my figures (household/individual in tonnes):

House (gas & electric):	2.28	1.14
Car:	0.46	0.23
Train:	0.59	0.3
Food (estimated):	2.8	1.4
Total:	6.13	3.07
Other Stuff:	?	?



So first of a bit of audience participation.

What do you think the per person, per year, average UK carbon footprint is?

Okay I know there are lots of ways of measuring it...

Remember one kilo is a bag of sugar and 1000 Kg is one tonne.

http://www.carbonfootprint.com/
http://footprint.wwf.org.uk/
http://carboncalculator.direct.gov.uk/
http://www.myfootprint.org/
http://www.carbontrust.co.uk/solutions/CarbonFootprinting/FootprintCalculators.htm

~12.6 tonnes, a 1 m² pile of sugar would be over 12 m high.

If you piled the CO_2 into the same 1 m² square that would be a column 7 Km high, as nearly as high as Everest at 8.8 Km!

On UN figures US method for 2006, which are different again:
Qatar = 56.2
USA = 19
UK = 9.4
France = 6.2
Ethiopia = 0.1

Lots of different figures, but you get the idea, rich west dumps a lot of waste, the poorer parts of the world don't.

Mount Everest at 8848m, a bit higher than one average year's worth of CO_2...

In a life time (72 years) a column 57 times the height of Everest..!

In the UK 60 million of us produce a volume of CO_2 enough to cover the whole UK to a height of 1.7 km (about 1 mile). It's an awful lot however you think about it.

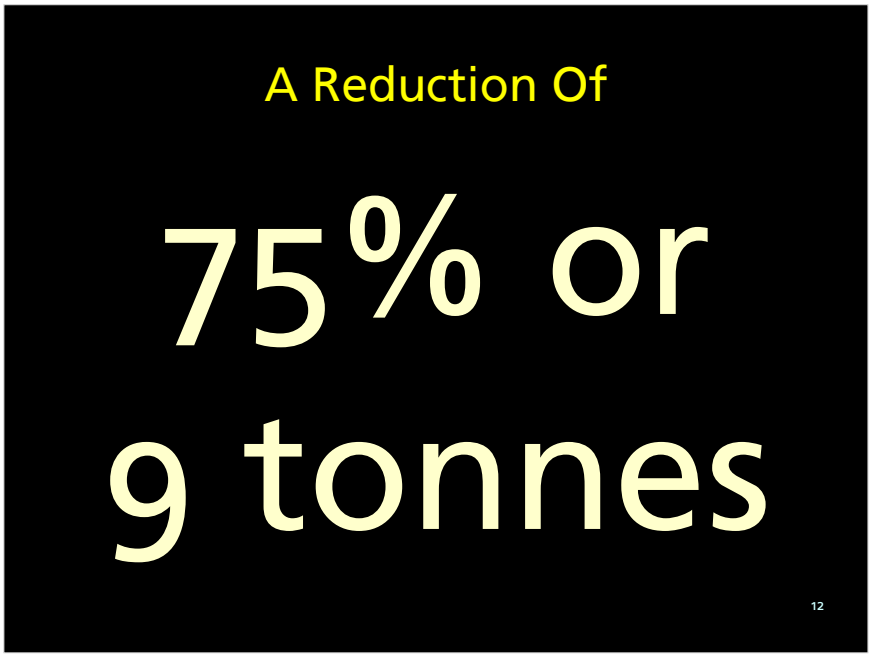
Picture details:

We believe that the ideal target should be no more than 3 tonnes per person per year.

In fact this is the figure that the UK has signed a treaty that we will achieve, by 2050.

Note that 3 tonnes is still more than 30 times the current output levels of many countries in Africa...

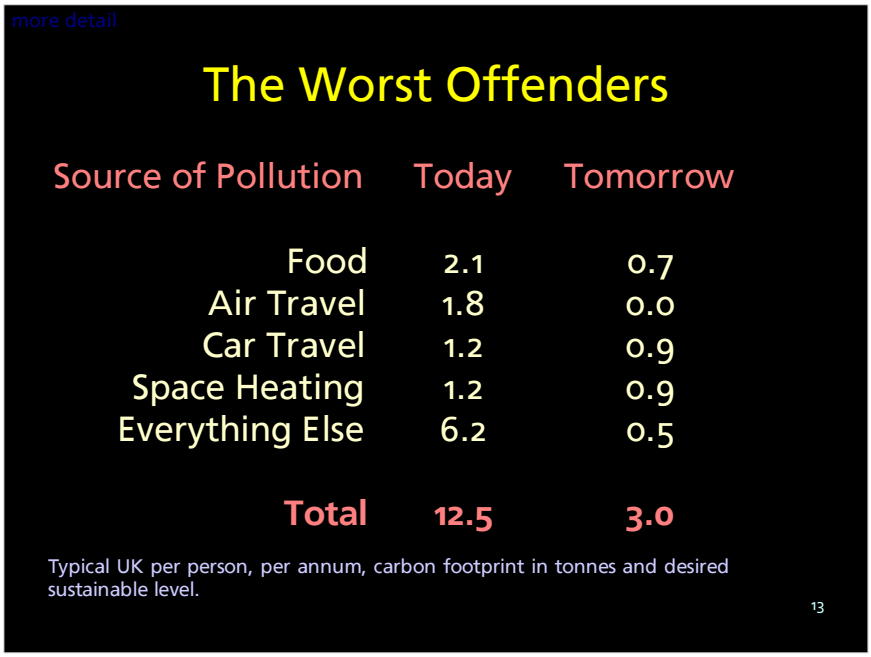
3 tonnes of CO_2, is a white Rhino of CO_2 per person per year. That's still a lot of CO_2, but the plants and the sea can probably absorb it.



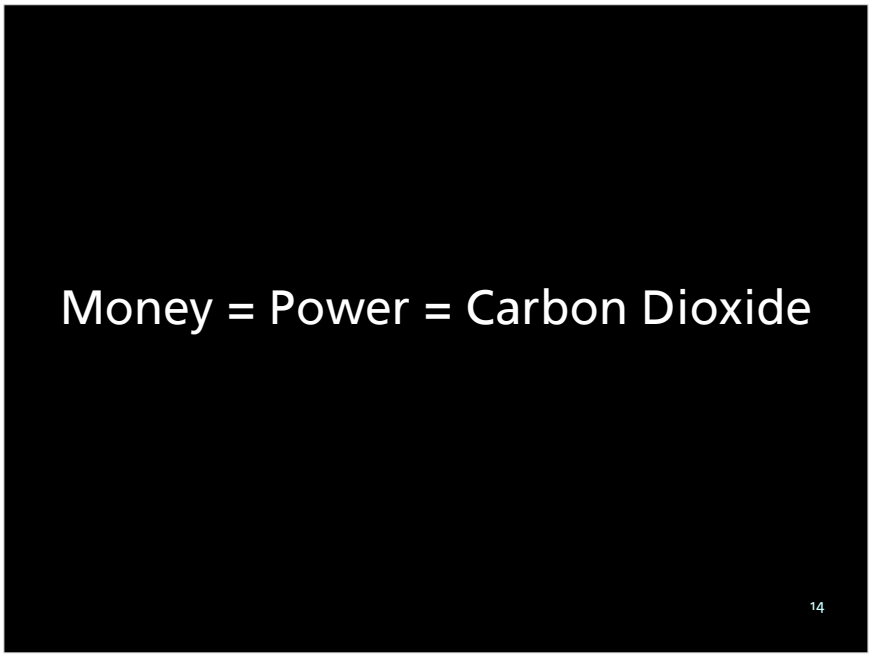
So to go from 12.6 tonnes to 3 tonnes (or what ever that really is) everyone needs to cut their output by at least 75%.

I'm not expecting to make that reduction overnight, BUT we must start now to make progress, plus to be honest the first 10% is a lot easier to save than the last 10%....!

Remember the UK treaty target is to cut 1990 levels 80% by 2050.



Source	today	ideal	saving	percentage
Space heating:	1.2	0.9	0.3	25%
Water heating:	0.3	0.2	0.1	33%
Gas cooking:	0.1	<0.1		
Lighting:	0.1	<0.1		
Electrical appliances:	0.6	0.4	0.2	33%
House Total:	**2.3**	**<1.7**	**0.6**	**26%**
Car	1.2	0.9	0.3	25%
Bus & Rail	0.1	0.1	(no change)	
Air travel	1.8	0.0	1.8	100%
Transport:	**3.1**	**1.0**	**2.1**	**32%**
Other Direct	0.6	0.3	0.3	50%
Food	2.1	1.3	0.8	38%
Other Indirect	4.4	-1.3	5.7	129%
Grand total	**12.5**	**3.0**	**9.5**	**76%**

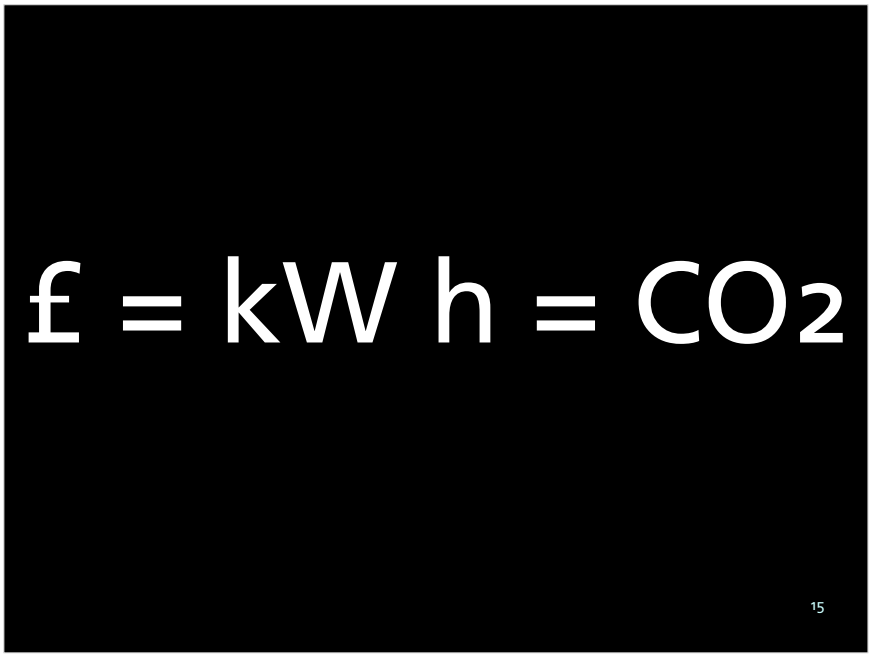


Almost everything we do using power (energy) costs money and produces CO_2.

So as a general rule to reduce CO_2 we want to use less power/energy and that will have the benefit of also saving money.

In many cases producing less CO_2 will save you money – though the pay back will vary from instant to many years.

We will have to look at the slower rate of return technologies but it's more sensible to start with the quick wins.



Almost everything we do using power (energy) costs money and produces CO_2.

So as a general rule to reduce CO_2 we want to use less power/energy and that will have the benefit of also saving money.

In many cases producing less CO_2 will save you money – though the pay back will vary from instant to many years.

We will have to look at the slower rate of return technologies but it's more sensible to start with the quick wins.

Where do we begin?

We'll building a 50m wind turbine isn't an easy start.

Image from http://www.goodplanet.org/

To make things easy I'm going to break things up into things that cost nothing, something and a lot.

For the free and easy suggestions you can try these at home today. There is no excuse to not start with these here and now.

The middle ground will cost you some money and will take some planning, but they are not going to break the bank or require to carry out significant changes to your life style. These are things we should all look at and do some of them over the next year.

Finally I'll briefly mention the more substantial changes that are required to get to a real low carbon life. I'm not going to concentrate on them we can discuss them in a years time once everyone has done the first two.

Image: http://www.flickr.com/photos/essjay/95611580/

I'm going to start with things that cost nothing.

In 1971 average winter room temp with central heating was 15C, by 2001 it had gradually risen to 19C. It's risen since these data collected, it's probably over 21C now.

An old 75% boiler going from 19C to 18C saves 1750 kW·h/year, or 12.5% of the total, or £50, or 330 kg CO_2. That's most of your space heating saving done and it's not cost you a penny!

16C is considered the minimum for healthy adults.

Obviously don't heat empty rooms or the house when you are not in it. You do know how to program your central heating system?

Image: http://www.flickr.com/photos/redvers/523072262/

Waste not, want not

More obvious “no cost” tips, instant savings:

Turn off things you don't use, don't leave them on standby, turn off lights when you aren't in the room.

Boil only the water you need

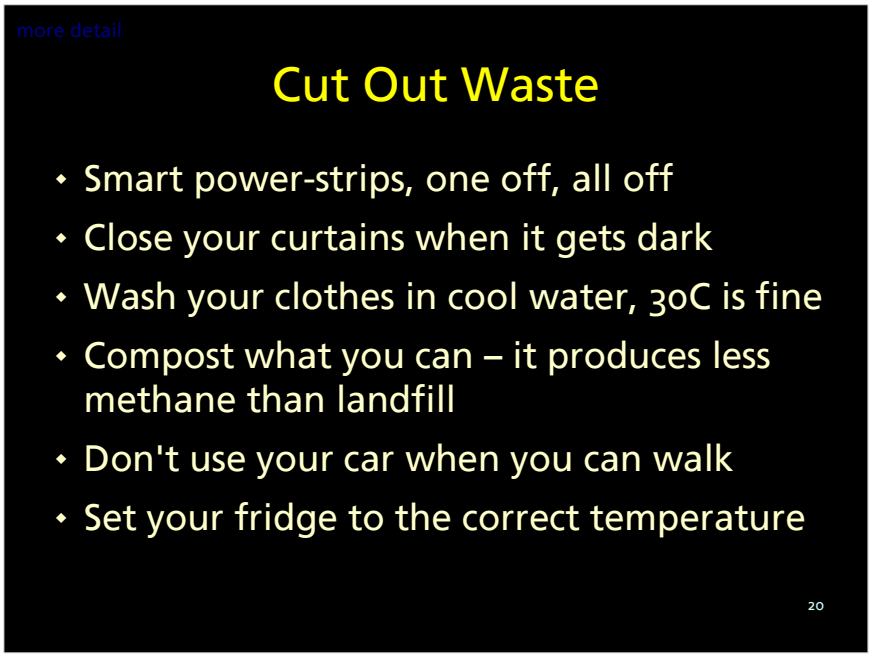
Take a short shower, rather than a long bath, drop the temperature and flow a little and stay a little shorter than normal.

Remember that this is all pure waste you gain nothing from heating and illuminating empty rooms!

1C on your central heating boiler and a few appliances being off could save £75/year.

Images:

http://www.flickr.com/photos/stevendepolo/3761878381/
http://www.centroheat.co.uk/
http://www.flickr.com/photos/m0php/2633588677/
Chealion



Waste is waste, you aren't getting anything for your money, you may as well set fire to a pile of fivers.

There are loads of obvious free tips to cut down waste and save, energy, money and carbon – far too many to put on this slide.

Remember a £100 is made up of one hundred pounds, and each pound is made up of a penny. Each saving on it's own won't make much difference but taken overall cutting out waste can made a significant saving, there are 60 million of us in these islands that's a lot of waste.

One third off all food bought it thrown away uneaten!

That's 5.1 million spuds per day, 4.4 million apples or 1.6 million bananas.

Do you remember your fist banana? My mother remembers it vividly, lots of people of a certain age will, because for much of the second world war you couldn't get them. Now we throw away 1.6 million of them per day uneaten... That's more than 586 million a year or nearly 6 billion since the start of the century!

My mother didn't see a banana from the age of 3 until she was 9 years old and we throw away how many? Per day?

BTW they come in their own package, do you put them in a plastic bag.

Are we bananas?

Image: http://www.flickr.com/photos/ramdac/372469203/

This set of energy saving tips will cost some money or take you some time to plan but not too much. They should be easy to do and you should get your money back pretty quickly.

Yes the sheep picture is cute and gratuitous but it's well insulated unlike most British homes...

Heating your house is one of the big three of carbon sources in your life. British houses are rather leaky, an awful lot of the heat we put into them escapes to heat the neighbourhood and not our homes. UK average is E on the EU's building energy rating (A-G scale).

Who remembers the "SAVE IT" campaign from 1976, I do. Sadly nothing has changed since then, we still don't save energy.

Again there is a strong focus on reducing waste but also choosing lower energy alternatives.

Image: http://www.flickr.com/photos/tambako/3020714772/

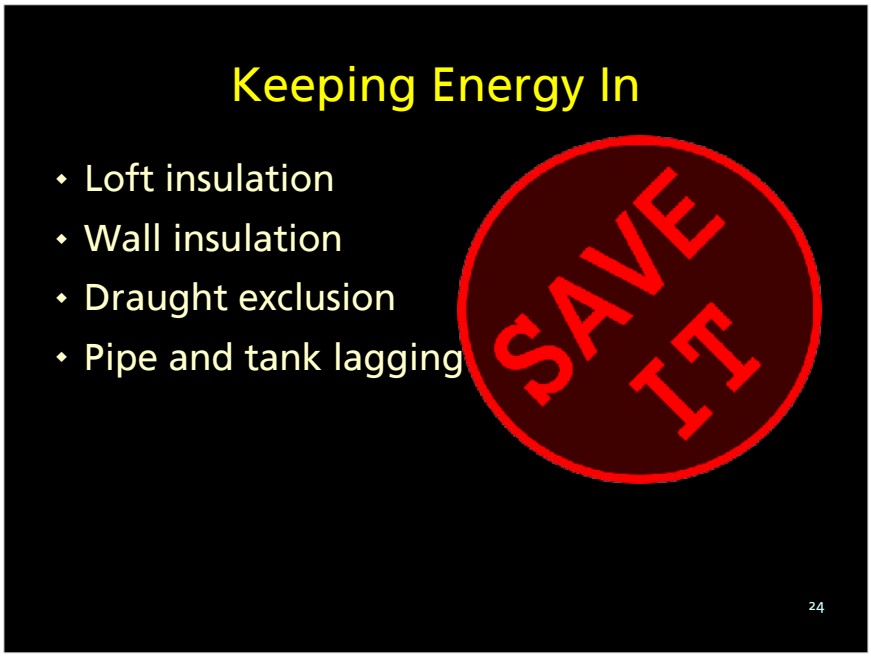
The Environment Centre estimate that an average house can waste £175 per year just through the fabric of the building if not properly insulated.

Insulation isn't free like turning the thermostat down, but it is cheap and if you do things in the right order it's not to expensive – and there are grants available for it.

A lot leaks through the wall. Next there is the roof, often poorly insulated if at all. There are draughts everywhere and a lot is conducted into the ground through the slab. Finally there are the windows – you do close the curtains don't you?

If your boiler is less than 5 years old and in good working order you only need to set the programme correctly, a sensible temperature and with adequate insulation you your house is probably doing very well.

Image:
http://www.flickr.com/photos/treehouse1977/3782393404/



Loft insulation £200 for a 3-bed house installed by B&Q. You may save £110 per year.

Wall insulation, e.g. Cavity wall insulation again from B&Q, £200, you may save £90 per year.

External wall insulation may save £300 but is more expensive and alters the appearance.

Draught excluding tape and heavy curtains or liners, chimney balloons, all cheap and easy, variable savings.

Remember space heating is 1.2 tonnes and doesn't come cheap. There are grants available for this:

CERT 100% grant for over 70s towards loft/cavity wall insulation. Warm Front, up to £3500 for C/H certain groups and £300 for over 60s on C/H repairs and installations.

There are lots of energy inefficient devices in our homes. The light bulb is an obvious example, but our C/H boilers, fridge/freezers, TVs and lots of other things waste energy and are inefficient.

When they break or we want to replace them we should always look for A rated options or better. Some things are so inefficient and the alternatives are so cheap that I wouldn't bother waiting: rip out those old bulbs and put in new ones!

Some things like your C/H boiler cost a lot of money, £1000 or more so don't go putting in a new one one a whim.

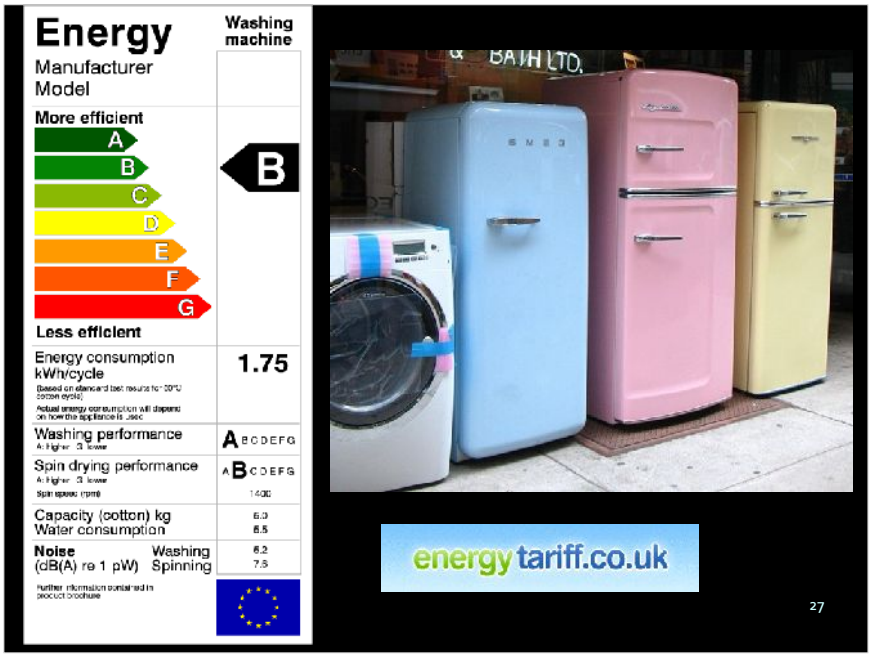
Image:
http://www.flickr.com/photos/caveman_92223/3346906435/

The CF light bulb has come to symbolise cheap energy saving. At the same time the early ones were odd coloured, slow to warm up, not very bright and didn't last as long as we were told. They were also expensive and bulky.

Modern CF bulbs have no mercury in, light up quickly, are bright, last well, have a nice colour, last for ages, and are silly cheap, 10p from Aldi/Lidl/Robert Dyas etc. Most power companies also give them away. You can get small ones and ones for dimmers.

LEDs are also on the way and they are 10 times more efficient again, so more than 100 times as efficient as an old bulb!

Image: (c) Armin Kübelbeck



Lots of things including houses and cars now come with an EU energy label. They should tell you how efficient what you are going to buy is compared with other items of the same type.

This has been a good thing, there are now almost only A rated fridges on the market now, so much so that they are sub-divided into A, A+ and A++.

However do remember that a big "A" rated appliance may still use more energy and produce more CO_2 than a small "B" rated one.

You need to do the sums but in general "A++" rated devices will pay for themselves in 3-5 years. Also consider technology, a good washing machine with low water usage and a good spin speed is cheaper/lower in CO_2 than an A rated tumble dryer.

Image: http://www.flickr.com/photos/vilseskogen/3317618608/

Food...

Food is a huge contributor to your CO_2, 2.1 tonnes if you remember. So you have cut out waste, what do you do next?

Eat less processed food – home made tastes better
Eat less long haul food – fresh/seasonal tastes better
Eat less food – we can all do to lose some weight anyway
Try going veggie for a day – I like meat but I don't eat it every day for every meal

There is more to come on this...

Image: copyright su-lin

You new this was coming, transport is 3 tonnes at the moment on it's own. If we carry on travelling as we do, we will all have to eat nothing and live in caves...

Without radically changing everything it is possible to cut your travel CO_2 down drastically, but it takes some effort.

Walk, bike, and bus or train. Try and avoid flights... Travel in g Co2 per km travel:

Cars:	100 - 400+ (180 UK Average)
Rail:	49 - 64 (depends on speed an load)
Bus:	28 - 100 (full coach – empty bus)
Aeroplane:	100 - 300+ (hard to estimate)

With you car you need to reduce your distance, car pool, ride share, are the obvious options. Overton is all walkable 2 km from here to the bridge over the train track, Berry down lane or Southington or outside the village on sapley or Waltham.

Image: public domain.

The first thing to do is avoid waste as I have already covered. Next we need to actually reduce what we buy, don't buy a new phone ever year, wait a year longer, we need to reduce the rate we buy stuff.

Next we need to repair what we have, lots of things are thrown away that are repairable, electrical goods are tossed aside with almost no attempt to fix them yet most are cheap and easy to repair – contrary to popular opinion.

So your computer isn't fast enough to play the latest game, yet it doesn't need to go into landfill, sell it or give it away, it'll be perfectly fine for someone else. If you can't be bothered with eBay, there is Freecycle and other charities that will reuse it for you. You may even consider buying reused computers from Jamie's in Southampton for example.

Recycle to avoid land fill, it's the last resort really and not much use, finally there is responsibly dispose of.

Now we come to the bigger changes that require you to spend possibly a lot of money and make larger changes to you life.

In this picture we see PV cells on German houses, a very major expenditure that reduces the demand on dirty grid power. They cost a lot to install, don't work so well in winter or in cloudy dark countries and still don't produce enough on their own to replace grid power, even with all efficient devices on the inside and careful behaviour.

You can look a lots of big ticket changes here but they will take more money and time to mature. We need to start somewhere but it's a lot cheaper to use less electricity than it is to generate your own.

Image: http://www.yannarthusbertrand2.org/

The plane is back...

Even with the best will in the world and the most efficient aeroplanes possible, they still produce a lot of CO_2, and we travel huge distance in them, so one return trip to the US is 3.6 tonnes.

Short and medium haul flights can be replaced with trains, but it will probably cost a little more and you won't get there as fast – make the journey part of the fun!

Long haul flights just generate too much CO_2, minimise or combine them but ultimately they have to end.

Image: Adrian Pingstone, released to the public domain.

Food is a huge source of CO_2. The whole supply chain is huge, every bit consumes energy and produces pollution – even the animals.

Fertilizer production and decay is messy, cows fart methane, tractors and trucks produce CO_2, cooking and refrigeration costs a fortune, supermarkets belch huge quantities of CO_2, the whole process is massively wasteful.

Eat local, eat seasonal, eat unprocessed, eat whole foods, make stuff yourself, go sustainable (organic is the closest), aim for one day per week veggie and one day vegan.

Image: Daniel Schwen

Car travel, again.

If you can, don't have car, rent one of you need one.

If you must have a car, get a as small as you can go, get a diesel engine with manual transmission. Do your best to not drive it, it's the miles that produce the CO_2, it's quite harmless sitting in the garage.

Try car pooling, working from home, or bus/rail for commuting, it's not that expensive if you get a season ticket, in fact it could be cheaper. Bikes are fantastic, there is the bike to work scheme and SWT are renting out British made Bromptons! They cost £100 per annum if you have a season ticket. See: http://www.southwesttrains.co.uk/bromptonbikes.aspx for details.

Image: Lokal_Profil

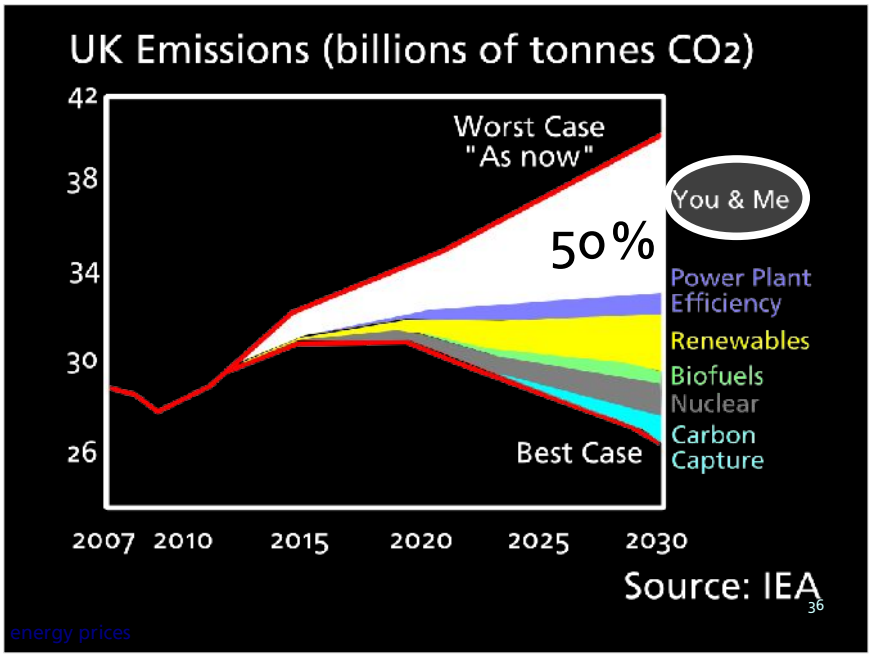
Why should bother, what difference can one individual make?

Well you could save a lot of your money, you are more than welcome to give me the money it's about as sensible as burning it which is what most of us are doing.

Remember £1 saving per person per year is £60 million if everyone in the country did something – now I'd like money like that!

If we all saved 1 kg of CO_2 per week, that's 3.1 million tonnes of CO_2, or just over 41 RMS QM2....

But we all know it's industry and power plans and such isn't it?



The figures here are from the International Energy Agency.

The top red line is what will happen to our CO2 emissions if we do nothing. The bottom red line is the best case, based on lots of things that we hope will work.

As you can see about 50% of the possible reduction is our reduction, not government, not big business, ours.

We need to reduce the energy we “consume” and we'll reduce the CO_2 we produce. The old way to may that level of difference is to reduce our energy demands.

Reduce waste, waste is just burning money it costs you money, generates CO_2 and you get nothing for it.
Reduce non-essential energy use, there are lots of things we do that we shouldn't do. We're generating a lot of CO_2 for almost no real purpose.
Finally we'll have to reduce our real energy use, but that's nothing to worry about for this year. Personally I believe it's coming but not quite now.

Tonight everyone can go home and make a difference, we can cut out waste and start looking at our non-essential energy use. Everyone is different so we're not all going to do the same thing but all of us can do something.

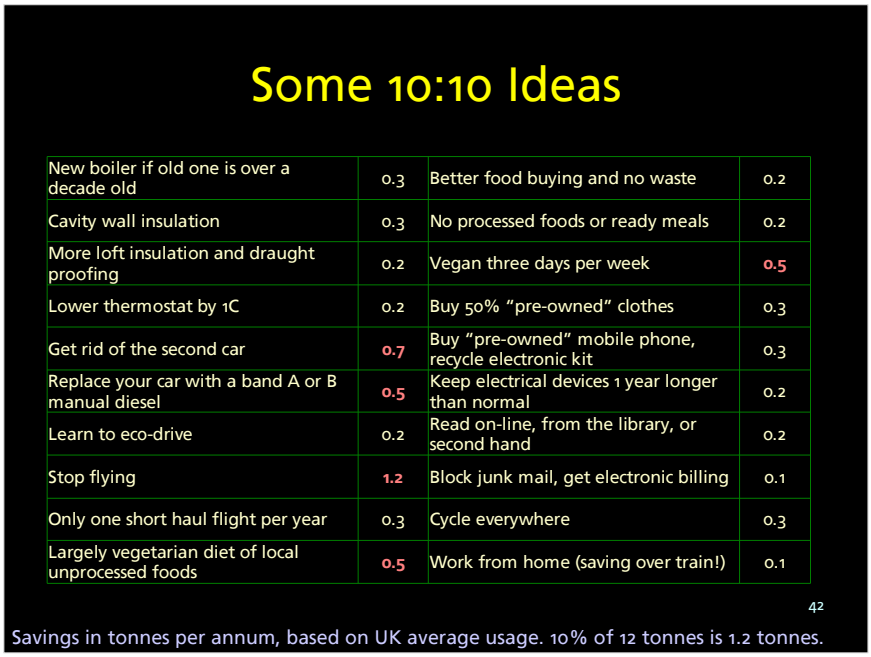
I think that gets the point across..

What is the 10:10 campaign?

The idea is to cut your carbon emissions by 10% by the end of 2010. Anyone can take part, individuals, clubs and societies, companies and even government.

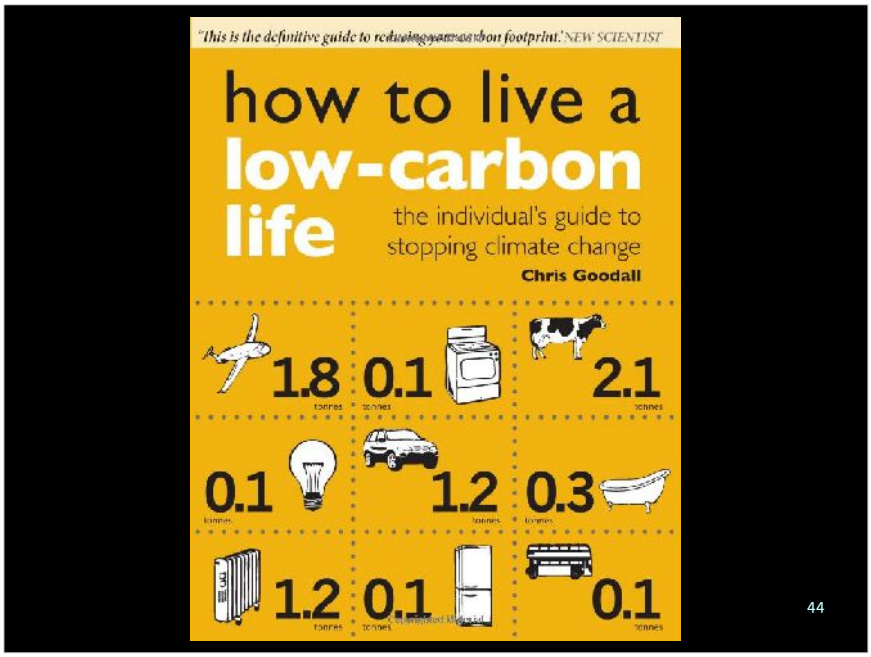
The campaign has the support of an awful lot of people and is an excellent way to START our journey towards a low carbon life.

I've joined and there is no reason that you can't. I hope to see everyone in one year's time and hear how we have all made a difference in our own ways.



Some suggestions, the big savings are in salmon pink...

Okay, I've spent a lot of time talking, now it's your turn!



Chris's book.

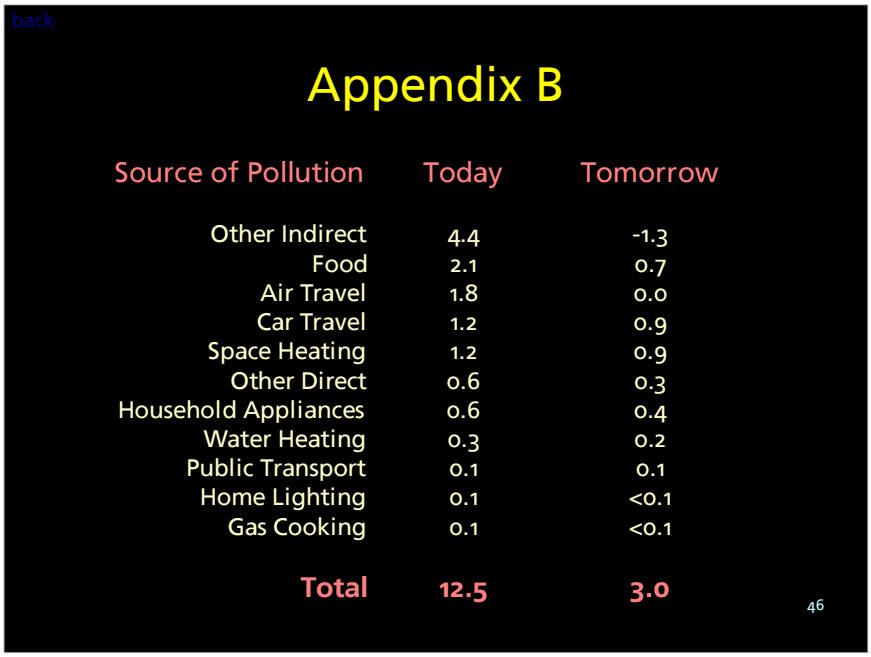
How to Live a Low-carbon Life:

The Individual's Guide to Stopping Climate Change

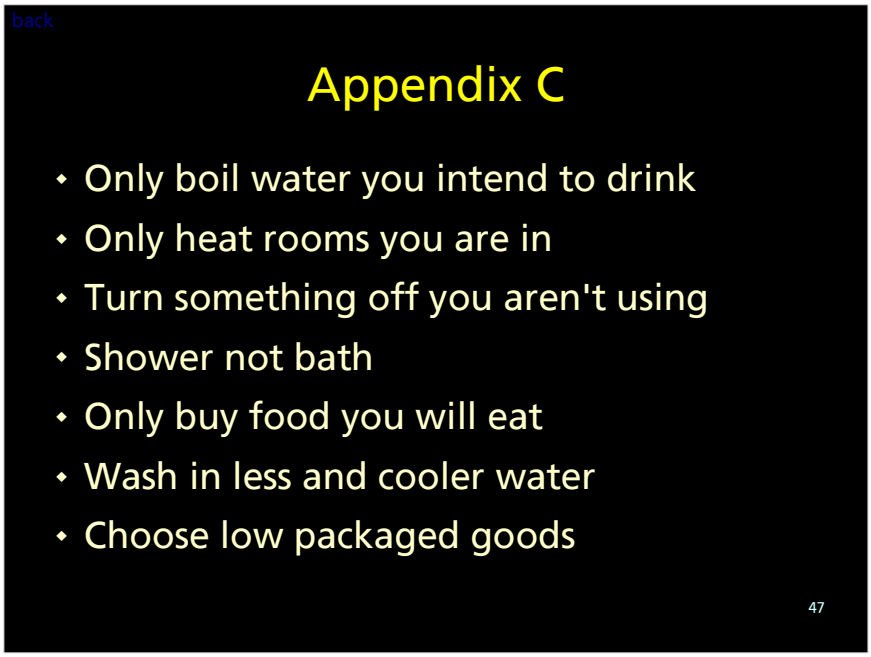
by Chris Goodall.

Earthscan Publications Ltd, 8 Feb 2007, ISBN 1844074269.

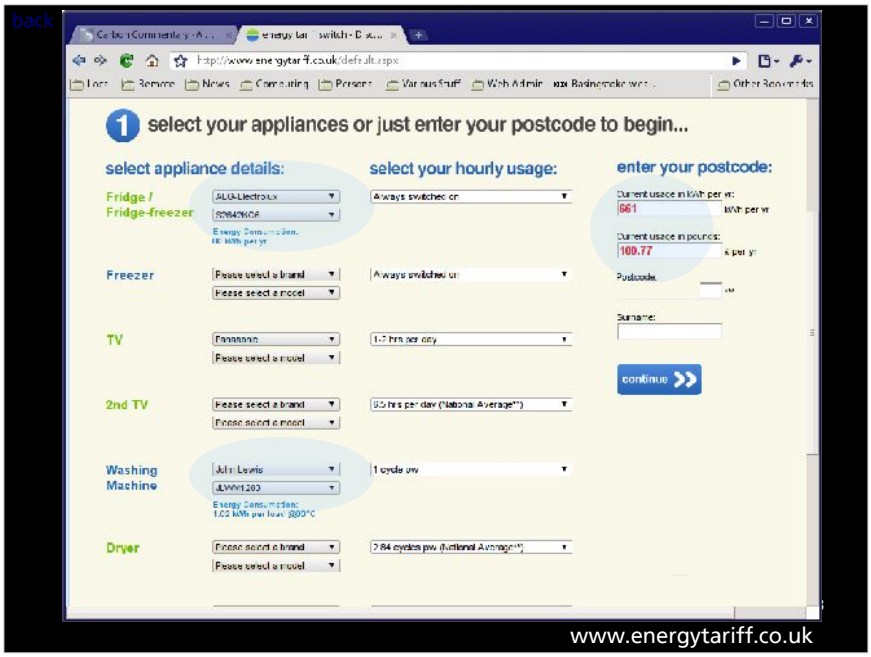
Some more links.



Source Chris Goodall, from how to live a low-carbon life, figures from 2007.



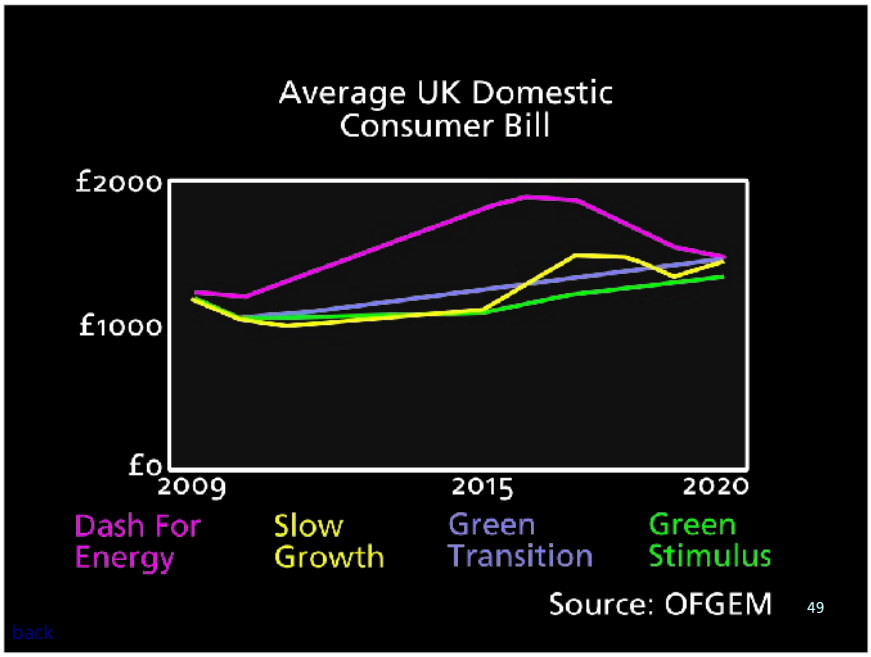
Some more ideas



This web site allows you to put in your appliances and it will estimate (where possible) how much energy use in a year and how much money they cost you to run. You can then try and get a better electricity/gas price if you want.

Here I've used it to work out how much my fridge/freezer and washing machine use. BTW we wash at 30C not 60C and our TV wasn't listed, so it's not perfect. Sometimes this is the best you're going to get as most retailers aren't interested in this.

You can also go to the library and look things up in “Which?” but again it doesn't cover everything.



What they expect our domestic energy prices to do.