

growing huge amounts of our own fruit and vegetables by making more land available."

#### Saturday 28th March

At 8.30 pm people all over the world will be switching off all lights for one hour, as a demonstration to decision-makers of the absolute necessity to deal with climate change. For more details visit: [www.earthhour.org](http://www.earthhour.org)

#### Sunday 29th March

Lord, many people in developing countries are suffering the effects of climate change through our habits of consumption. We pray for all who are working to relieve malnutrition, disease and human suffering. Be close to them when they face obstacles of bureaucratic obstruction, corporate greed and the tyranny of prejudice. Support them in every circumstance and crisis and make your presence known to them at every time of need.

#### Monday 30th March

The Co-operative Group, Britain's largest farmer, has announced that it will suspend the use of neonicotinoid pesticides on its farms because of their suspected role in the disastrous decline of our honeybee population. At the launch of the group's 10-point plan to reverse the decline in honeybee numbers, the Co-op's senior technical manager said: "We believe the recent losses in bee populations need decisive

action and, as a result, we are temporarily prohibiting the eight nicotinoid pesticides until we have evidence that refutes their involvement in the decline." Other major landowners should follow suit before the decline becomes irreversible.

#### Tuesday 31st March

A special report in the New Scientist entitled "Everything you wanted to know about being green, but never dared ask" looked at the single most effective thing we can do for the environment.

The answer: "Over a 75-year lifespan, the average European will be responsible for about 900 tonnes of CO<sub>2</sub> emissions. For Americans and Australians, the figure is more like 1,500 tonnes. Add to that all of humanity's other environmentally-damaging activities and, draconian as it may sound, the answer must surely be to avoid reproducing."

#### Sources:

"Sustainable Energy without the hot air"  
by David JC MacKay

"Ten Technologies to Save the Planet"  
by Chris Goodall (GreenProfile £9.99)

New Scientist

[www.edie.net](http://www.edie.net)

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Picture on front cover: Purple Saxifrage (*Saxifraga oppositifolia*) an arctic-alpine plant in March on Pen-y-ghent, Yorkshire. by J.A.

## Prayer guide for the care of creation

# March 2009



"Rejoice in hope, be patient in suffering, persevere in prayer." (Romans 12.12)

"Act as if everything depended on you; wait as if everything depended on God."  
(St. Ignatius Loyola)

"God could do his work on earth without us, but he chooses not to because he wants it to be a team effort. Does that mean that if you and I do not make ourselves available to him, then some things just might not get done? I wonder."  
(Selwyn Hughes)

"The work of keeping the gnawing dogs of truth at bay takes far more energy than admitting the awful truth. When we are committed to honesty, to seeing things as they are, without denial or distortion, we have only to knock at the door of truth to find it ready open and the Bread of Life deposited in our hands."  
(Selwyn Hughes)



ChristianEcologyLink

## Sunday 1<sup>st</sup> March

Lord, we lift up to you the witness of Christian thinkers, teachers, scientists and commentators on the environment and the world that you created. We thank you for those who have worked to create beauty, fruitfulness and order. We pray for our generation, that we may hand on to our successors a world better for our having lived in it.

## Monday 2<sup>nd</sup> March

In his new book "Sustainable Energy – without the hot air" David MacKay examines, with a wealth of statistics, all the currently discussed methods of weaning ourselves from our addiction to fossil fuels. He proposes six alternative plans based on different assumptions. They have three features in common:

- Electrification of all public and private transport;
- Insulation of all buildings to the highest standards, with heating provided by solar panels and/or heat pumps;
- Tripling of electricity generation with a mix of power sources including wind, solar PV, waste incineration, wave/tidal power and possibly nuclear power.

## Tuesday 3<sup>rd</sup> March

He looks at all available means of capturing and storing CO<sub>2</sub> and finds that the energy cost of mopping up the typical European output of 30 kg. per person per day is likely to be 16.5 kWh per person per day – exactly the same as current British electricity consumption. In other words a "giant vacuum cleaner" would require us to double our electricity production.

As to storage of carbon in the form of dry wood sufficient to counterbalance the typical European output of CO<sub>2</sub>, we would need 7500 sq. metres of forest per person – that's twice the area of Britain.

He sees more promise in fertilising large areas of ocean with urea, though he does not explain where the urea is to come from.

## Wednesday 4<sup>th</sup> March

UK housing is responsible for 27% of our CO<sub>2</sub> emissions. MacKay points out that heat loss from buildings decreases by 10% for every degree that we turn our thermostats down. Despite the fact that in 1970 winter temperatures in British homes averaged 13<sup>o</sup> C., many people now think that 17<sup>o</sup> is unbearably cold. His advice is not to think in terms of a thermostat setting, but to leave it at a low value and turn it up temporarily whenever we feel cold. The simple step of adding loft and cavity-wall insulation to a typical house reduces heat loss by about 25%, which translates roughly into a 40% reduction in energy consumption.

## Thursday 5<sup>th</sup> March

A consultation on the Government's new Heat & Energy Saving Strategy aims to cut emissions from existing buildings to zero by 2050.

Measures proposed include:

- Giving 7 million homes (25% of the total) a full energy makeover by 2020 and the rest by 2030, including energy saving measures plus renewable heat and electricity. All lofts and cavity walls to be insulated by 2015.
- Widespread availability of home energy advice.

system taxes the repair man and surrounds his business with time-consuming paperwork. In next month's budget the Chancellor has the opportunity to move taxes from goods and services towards taxes on environmental damage. A high price for carbon is essential to promote investment in renewable technology and energy efficiency. The Royal Commission on Environmental Pollution says that the UK should introduce a carbon tax, which should apply "upstream" (i.e. at the source of emissions) and cover all sectors. MacKay addresses the question "What price would CO<sub>2</sub> need to have in order drive society to reduce CO<sub>2</sub> pollution? "A price of \$110 a tonne would transform large-scale renewable energy projects that now cost 3p. per kWh more than electricity from gas into financially viable projects. At \$150 a tonne domestic users of gas would notice the extra cost in their heating bills. A price of \$370 a tonne would significantly reduce people's inclination to fly."

## Tuesday 24<sup>th</sup> March

Most of the possible savings in energy use stem from individual action. Here are some of MacKay's examples:

Turn down the thermostat to 15<sup>o</sup> or 17<sup>o</sup>.

Fit thermostats to all radiators.

Turn off heating when nobody is in.

These actions would save 20 kWh daily.

Stop flying would save 35 kWh a day.

Drive more gently, use an electric car, join a car club, use public transport, cycle or walk. These would save 20 kWh a day.

Don't buy clutter. Avoid packaging. This also would save 20 kWh a day.

Eat vegetarian six days out of seven. This would save 10 kWh a day.

## Wednesday 25<sup>th</sup> March

The Archbishop of Canterbury, Dr. Rowan Williams, gives the Ebor Lecture at 7.30 today in York Minster on "Renewing the Face of the Earth: Human Responsibility and the Environment". Entry is free, but must be booked in advance. Email: [eborlecture@yorks.ac.uk](mailto:eborlecture@yorks.ac.uk) or write to: Ebor lectures, School of Education & Theology, York St. John University College, York YO31 7EX.

## Thursday 26<sup>th</sup> March

Londoners are being encouraged to recycle their rubbish by taking part in an electronic game which scores them points for catching recyclable material in a green box and loses them lives if the dustbin "eats" recyclable items. The game will work on most internet-ready mobile phones and can be downloaded by texting BIN 62967. More than 60% of London's rubbish is recyclable, but only 20% is actually recycled. Mayor Boris Johnson said: "I am very excited that the new Recycle for London campaign is using innovative technologies to boost recycling and my message is: Starve your bins and recycle, recycle, recycle."

## Friday 27<sup>th</sup> March

Land for allotments has halved over the last 20 years because food has been so cheap in the supermarkets. Now the National Trust is giving over a large proportion of its 612,000 acres to allotments for growing food. Experienced gardeners are being asked to share their skills and there will be open days, cooking demonstrations, giveaway seeds and sharing of recipes. Professor Tim Lang of City University said: "We have a big problem in that we have a food system and land ownership that keeps people away from the land. The National Trust is an honourable exception. We could be

to raise this figure to 20 GW. by creating 12 additional facilities, mainly in Scotland. Demand management using electric vehicles. Smart battery chargers would be designed to operate when the wind blows and to switch off when the wind drops. A national fleet of 30 million electric cars with 40 kWh of associated batteries adds up to 1200 GWh. If the batteries were exchangeable for fully charged batteries at filling stations, the system would be robust enough to meet the demands of car drivers and the need for back-up for wind turbines.

#### Thursday 19<sup>th</sup> March

A Climate Change Day of Action is arranged today at Coventry by Christian Aid, CAFOD and WDM. The events include a march round the city, talks by CAFOD partners. James Hansen, former director of NASA, and James Jones, Bishop of Liverpool, will be speaking in the cathedral. Contact: [ckelling@cafod.org.uk](mailto:ckelling@cafod.org.uk) or ring 020 7095 5414.

#### Friday 20<sup>th</sup> March

In all the six alternative plans proposed by David MacKay, it is assumed that incineration of municipal waste will be scaled up, so that all waste that can't be recycled is incinerated rather than landfilled. This would require a ten-fold increase over the incinerating power stations operating in 2008. London would have 12 30-MW. waste-to-energy plants like the existing SELCHP plant, and every town of 200,000 people would have a 10-MW. waste-to-energy plant. "Any fears that waste incineration would be difficult, dirty or dangerous should be allayed by the fact that European countries which incinerate far more waste per person than the UK include Germany, Sweden, Denmark, the Netherlands and Switzerland – not usually nations associated with hygiene problems!

A good side-effect is that waste incineration eliminates harmful methane emissions from landfill sites.

#### Saturday 21<sup>st</sup> March

Concentrating Solar Power (CSP) is a proven technology which, at its Andasol (Spain) prototype, provides 350 GWh per year (40 MW.) using parabolic troughs. It occupies 400 hectares of land. In order to supply Britain with all its electricity from CSP plants in the Northern Sahara, the area of land required would be 145 km. x 145 km. – an area the size of Wales. To supply everyone in Europe and North Africa with an average European's power consumption would require an area of desert the size of Germany. High-voltage direct-current (HVDC) transmission lines are already used to transmit electricity for over a thousand kilometres in South Africa, China, America, Brazil and Congo. The power losses on a 3,500 km. line, including conversion from AC to DC and back again, would be about 15%. For technical details and estimates of cost, useful websites are: [www.stirlingenergy.com](http://www.stirlingenergy.com) and [www.trec-uk.org.uk](http://www.trec-uk.org.uk)

#### Sunday 22<sup>nd</sup> March

Show us, dear Father, what we must do to protect your beautiful world, not just the plants and animals, but the soil, air and water by which we live, so that no-one may exploit or pollute them for their own profit or convenience. Help us to cherish these necessities for our survival, and guide those in authority to ensure that the human spirit may not be starved in pursuit of material comfort and wealth.

#### Monday 23<sup>rd</sup> March

It is often cheaper to buy a new microwave, DVD player or vacuum cleaner than to get a faulty one repaired. This is because the tax

- Financial support to allow costs to be more than offset by energy bill savings.
- A widening of Building Regulations plus a new voluntary code of practice.
- A focus on district heating in suitable communities and removing barriers to their development.
- Encouragement of Combined Heat & Power (CHP) and better use of surplus heat through carbon price mechanisms.

#### Friday 6<sup>th</sup> March

The term "Climate Change" lacks the punch required to galvanise action on carbon emissions, according to the Chartered Institute of Water & Environmental Management (CIWEM), whereas "Global Warming" confuses the public as we emerge from an unusually cold winter. Suggested substitutes include "Climate Churn" and "Climate Convulsion". John Sterman of the Massachusetts Institute of Technology suggests "The Bathtub Effect", likening the Earth to a bath where water pours from open taps twice as fast as it drains away. Unfortunately, comments A.C Grayling in New Scientist, the taps are stiff and take a long time to turn off. Also, the weight of water already in the bath has almost blocked the drain. Already there might be no way of preventing a flood.

#### Saturday 7<sup>th</sup> March

Today Gloucestershire Churches Environmental Justice Network, Clifton Justice & Peace Commission and CEL have arranged a Day of Reflection on the churches' response to the climate crisis. From 10.30 to 4 at St. Edward's Junior School, Charlton Kings, Cheltenham GL52 6NR, the sessions will be led by Frank Regan of the Justice & Peace ministry, with

prayer, reflection and networking. Admission free, but bring lunch. Details from Martin Davis on 01242 575779 or email: [martindavis@gmail.com](mailto:martindavis@gmail.com)

#### Sunday 8<sup>th</sup> March

Lord, you know from the past how sinful humans can choose to ignore prophetic warnings while magnifying everyday risks, raise up in this time of deep crisis people prepared to proclaim, without fear or favour, the message that we must make deep changes in our lifestyle if humanity is to survive.

#### Monday 9<sup>th</sup> March

MacKay compares the energy efficiency of Combined Heat & Power systems with that of heat pumps and finds that the electricity efficiency of CHP is "significantly smaller than the 49% efficiency delivered by electricity-only gas-fired power stations."

By contrast, ground-source heat pumps can deliver a combination of 30% efficient electricity and 80% efficient heat. They can be driven by any electricity source and can be turned on and off to suit the residents. They do require a large piece of ground for efficient operation. However, the best air-source heat pumps can deliver 3.6 kw. of heating while using just 0.845 kw. of electricity. [www.ecosystem-japan.com](http://www.ecosystem-japan.com) gives more details.

#### Tuesday 10<sup>th</sup> March

If, as we are told, "climate change is a greater threat than terrorism", should governments criminalise the "glorification of travel" and pass laws against "acts of consumption"?

Fanciful perhaps, but MacKay calculates that a single flight by jumbo jet to Capetown once a

year has an energy cost bigger than leaving a 1 kw. electric fire on day and night for a whole year. Also, because aircraft have to use energy both to overcome air resistance and to throw air down in order to maintain height, no re-design of aircraft is going to radically improve their energy efficiency.

#### Wednesday 11<sup>th</sup> March

If an area of British territorial waters 2/3rds the size of Wales were filled with offshore wind turbines, the maximum power delivered would be 16 kWh per day per person. This would be provided by 44,000 3 MW. turbines, which works out at 15 per kilometre if evenly spaced around our 3,000 km. of coast. Deepwater offshore wind farms could deliver another 32 kWh per day per person, but experts reckon this to be prohibitively expensive. Obstacles include:

- Exposure to corrosion. The Horns Reef wind farm off Denmark had to have all its 80 turbines dismantled and replaced after only 18 months.
- The creation of 16 kWh/d/p of offshore wind power would require 15 million tons of concrete and steel – just less than the amount of steel required for all 2,751 US Liberty ships built in WWII.
- The erection of 10,000 offshore turbines over 10 years would require about 50 specialist jack-barges, each costing £60 million.

Despite the obstacles, MacKay's preferred Plan 6 envisages 29 offshore wind farms built at a cost of £36 billion and providing 3.5 kWh per day per person.

#### Thursday 12<sup>th</sup> March.

In a conventional fossil-fuel car only 25% of the energy used is involved in propulsion: roughly 75% is lost in making the engine and radiator hot. Its average fuel consumption of 33 mpg corresponds to an energy consumption of 80 kWh per 100 km., whereas a full train travelling at normal speed has an energy consumption of 1.6 kWh per passenger kilometre. A London tube train travelling at peak times, with regular stops and starts, uses 4.41 kWh of energy per passenger kilometre.

Another way to reduce fuel consumption is to reduce congestion. On any trunk road where the desired speed is 60 mph, the safe distance between cars is 80 metres. If each car contains 1.6 people, then by collecting 40 people into a single coach, you free up 2 kilometres of road.

#### Friday 13<sup>th</sup> March

MacKay suggests that, if we have to use private cars, electric vehicles are the best option. They have an energy cost of about 15 kWh per 100 km. – 5 times better than fossil-fuel cars and significantly better than any hybrid cars. "But the electricity is still generated by fossil-fuel power stations". Yes indeed, but if grid electricity emits 500 grams of CO<sub>2</sub> per kWh, then the CO<sub>2</sub> emissions of electric vehicles are 100 grams per kilometre – at least as good as the best fossil-fuel cars. Green electricity supply would have an even smaller carbon footprint.

Electric batteries are another problem. The battery of a Toyota Prius costs £3,500 and is expected to last 10 years. However, MacKay believes that, as car manufacturers compete for the electric car market, battery technology will improve significantly.

#### Saturday 14<sup>th</sup> March

Tomorrow is the London premiere of the film "The Age of Stupid", which is set in 2055, when the survivors of a climate convulsion discuss why earlier generations failed to forestall the disaster. There is, of course, a positive message too. The film will be released around the country on March 20<sup>th</sup>, 21<sup>st</sup> and 22<sup>nd</sup>. This film could touch the hearts of many who have never given the matter a thought. For more details, go to [www.ageofstupid.net](http://www.ageofstupid.net)

#### Sunday 15<sup>th</sup> March

Loving Father, we confess that we are too prone to say "no" to any new technology – "no" to wind farms, "no" to tidal barrages", "no" to anything other than the fossil-fuel supplies which feed our addictions. Help us to make honest judgments about the best technologies for the protection of your creation, not forgetting that the best results often flow from self-denial and a more economical use of resources. Guide our leaders as they make decisions which will affect all future generations. This we pray in the name of your dear Son who died to save us and all your creatures.

#### Monday 16<sup>th</sup> March

More than 1/3<sup>rd</sup> of the CO<sub>2</sub> that we produce results from generating heat for our homes, offices and factories – primarily using gas in boilers. Combined Heat & Power (CHP) systems use either gas or waste products to generate the steam which drives turbines for electricity, while most of the hot water is separated off to provide heating through a network of pipes. MacKay however believes that delivering the heat always reduces the electricity output. (This objection does not apply to district heating). He believes that we should move straight to heat pump technology.

Heat pumps act as refrigerators turned inside out. The inside of the refrigerator (the cold bit) is put in the garden, while the back panel (the warm bit) is put inside the house. For every kilowatt of electricity drawn from the grid, the heat pump puts 3 kilowatts into the house. Heat pumps are more efficient than condensing boilers, even if the heat pumps are powered by electricity from a gas-fired power station. Ground-source heat pumps require at least 150 sq. metres of ground and cost between £6,000 and £10,000. Air-source heat pumps, which use an external air-conditioner, are nearly as efficient. For details visit: [www.ecosystem-japan.com](http://www.ecosystem-japan.com)

#### Tuesday 17<sup>th</sup> March

With China and other nations building numerous coal-fired power stations, it is timely to question the oft-repeated assertion that "there's 250 years of coal left". The best estimate of global coal reserves is 1600 gigatonnes. In 2006 the global coal consumption rate was 6.3 gigatonnes a year. If the growth rate of consumption is 2% a year (as it was from 1930 to 2000), all the coal would be gone by 2096. But if the growth rate continues at 3.4% a year (as it has been since 2000), all the coal would be gone by 2072 – just 63 years away. Even without the harmful effects of coal burning on the climate, we would have to look elsewhere for our energy supplies.

#### Wednesday 18<sup>th</sup> March

"Wind power is intermittent and unreliable" say its critics. MacKay proposes two solutions: Pumped storage of water in high-altitude reservoirs ready for release to turbines whenever required. Dinorwg in North Wales, with three other facilities, can already produce 2.8 GW. of power at short notice. He proposes