The UNEP Magazine for Youth

TUNZA

UNEP

for young people · by young people · about young people

Kick the habit!

Techno-genius

Unlocking the future

Lights out

Counting carbon

Low-carbon chic

Making a stand

Every little helps

TUNZA
the UNEP magazine for youth. To view current and past issues of this publication online, please visit www.unep.org

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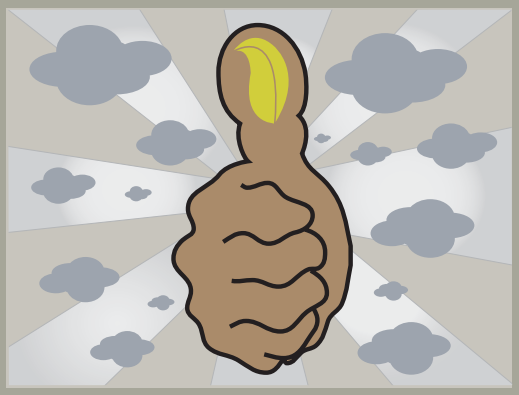
Partners for Youth and the Environment

UNEP and Bayer, the German-based international enterprise involved in health care, crop science and materials science, are working together to strengthen young people's environmental awareness and engage children and youth in environmental issues worldwide.

The partnership agreement, renewed to run through 2010, lays down a basis for UNEP and Bayer to enlarge their longstanding collaboration to bring successful initiatives to countries around the world and develop new youth programmes. Projects include: TUNZA Magazine, the International Children's Painting Competition on the Environment, the Bayer Young Environmental Envoy in Partnership with UNEP, the UNEP Tunza International Youth/Children's Conference, youth environmental networks in Africa, Asia Pacific, Europe, Latin America, North America and West Asia, the Asia-Pacific Eco-Minds forum, and a photo competition, 'Ecology in Focus', in Eastern Europe.



COOL & **COOLER**

COOL: Substituting your petrol-powered lawn-mower for a hand mower. A standard mower pollutes as much in one hour as a car driven anything from 200 to 500 kilometres, so switching to pushing power is a great way to trim your emissions, your waist and your grass all at once.

COOLER: Organic power. If cutting the lawn makes you feel sheepish, take inspiration from the parks of Curitiba in Brazil or Fort Saskatchewan in Canada, and break new grazing ground. In Canada, 50 sheep maintain 8 hectares of parkland – could some rabbits keep a small lawn in check?

COOL: Sitting down and reading your favourite environmental magazine, TUNZA, in a cosy café that serves coffee in a ceramic mug.

COOLER: Carrying your own mug to use for take-away coffees, cutting down on disposable paper or plastic cups.

COOLEST: Enjoying a cuppa while seeing how our world will look if the polar caps melt. The 'Global Warming mug' sports a map of the world which diminishes as hot liquid is poured into it, simulating sea-level rise.

COOL: Putting your computer to sleep rather than just turning off the monitor.

COOLER: Turning your computer all the way off when you've finished using it.

COOLEST: Switching to a laptop, which uses about half the energy of the equivalent desktop PC.

COOL: Making your calls from a water-powered phone. Motorola have teamed up with Angstrom Power to manufacture a mobile that runs on hydrogen fuel cell technology.

COOLER: Reliving your childhood with Horizon Fuel Cell's H2 racer – a mini model hydrogen car that runs on solar-generated hydrogen – while dreaming of driving off into the sunset when they develop the real thing.

EDITORIAL

It's been quite a party. For the past couple of centuries – and particularly over the past 60 years – we have been squandering the planet's vast treasury of ancient sunlight. Coal, oil and gas – fossil fuels made from life that flourished in the sun of prehistoric times – took many millions of years to form, but we have been burning them up in one massive binge. They have brought previously unimaginable prosperity and mobility to a minority of the Earth's people, and changed the very face of the planet, covering it with settlements that shine with light in the night sky. But now the party is ending.

Concern is growing that production of oil, the most important and versatile of the fossil fuels, may soon peak – turning what was for so long a cheap and abundant source of energy into an increasingly scarce and expensive one. If so, there will be widespread economic dislocation, for nothing else is yet ready to take its place. Even more importantly, the carbon dioxide released when the fossil fuels are burned is even now irrevocably changing the climate. Global warming is already occurring far faster than expected, and the world's scientists have repeatedly warned that unless we rapidly start to kick the carbon habit, and reduce emissions, dangerous climate change will be unavoidable.

It is falling to our generation to undertake this task, the most fundamental transformation ever attempted in the way we use resources. By 2050 the world will have to be emitting no more than half as much carbon dioxide as now. And far greater cuts than that will have to be made by those who have benefited most from the fossil fuel bonanza – the industrialized countries and the wealthy in developing ones – in order to leave room for the poor to develop. And we will need to stop and reverse deforestation, the second biggest emitter of carbon dioxide.

It's a tall order, but it can be achieved, even using technologies that we already have to hand. Clean, renewable sources of energy are rapidly developing, and can both tackle climate change and lift the poor out of their poverty. Above all, there is tremendous scope for dramatically cutting the waste of energy. Practical steps are spelled out in this issue of TUNZA, but – in the end – it begins with us. Let's make a start this World Environment Day.

K. Tanumitardja/UNEP/Topham

Kicking the habit

Fred Pearce

THE SCIENCE IS NOW CERTAIN. We are warming the atmosphere in ways that are dangerous – for some people now and for many more in the future. It is not just a question of temperature; some might like it warmer. But it is weird weather. There are more droughts in some places, more floods in others. Farmers don't know what crops to plant, or when. Amazingly, there could be no ice in the Arctic Ocean in summer within 10 years. As the world's ice caps melt, sea levels rise. And this is just the start of it.

That's the bad news. The good news is we can all do something about it.

We shouldn't be surprised about global warming. For 200 years, scientists have known that certain gases in the atmosphere, like carbon dioxide, trap the sun's heat and warm the air. Put more of them up there, as we are doing, and it's not hard to work out that the world will warm. We produce these gases in large amounts by burning fuels made of carbon – like coal, gas and oil – and by destroying forests. They are made of carbon, too, and their destruction causes about a fifth of the emissions.

We all contribute. Whenever we plug in a computer, or climb into a car, or heat our homes, or buy food, we are using energy made from burning carbon.

Everyone is not equally to blame, of course. If you live in Europe or North America or Australia, your contribution will be about three times higher than if you live in China, 10 times that in India, and up to 100 times that in Africa. Though, even in poor countries, rich people emit a lot of carbon.

The world's governments are acting to reduce emissions. The first agreement, the Kyoto Protocol, is now in force. And last December, on the Indonesian island of Bali, governments agreed to start talks on a new, tougher, deal. But progress is slow, while scientists have been surprised by the speed of climate change. So we all have to act. Now.

For most of us the biggest emissions are from energy used to heat or cool our homes. So adjust the thermostat a bit towards whatever the temperature is outside. If it's winter, put on a thick pullover; wear shorts in summer. In cold climates, stop heat leaking out by insulating your roof, windows and walls. If it's hot, keep the sun out by closing the windows and darkening the room till the sun passes and there's a breeze, then open the windows to catch it.

Your next biggest contribution is probably from travelling by car – maybe a sixth of your total. So do it less. Walk to school or college or the shops if you can. Or go by bus or train. Or share a car. People in some cities can get by OK without a car at all. But if your family needs one, next time make it a small, energy-efficient vehicle, like a hybrid. Check it out – car manufacturers now provide details of CO_2 emissions per kilometre travelled. But don't rush. Making a car creates about the same emissions as driving it for two years. So keep the old one as long as you can.

Next up are all the gadgets in the home. The big five domestic power guzzlers are refrigerators, tumble driers, computers, lighting and washing machines. Don't use a tumble drier unless you really need to. Hang washing outside to dry. And run the washing machine at a lower temperature, like 30ºC. Never run half loads.

Laptop computers use only about half as much energy as PCs. And you can cut use further by using the sleep function. Remember anything on standby is using electricity all the time. Believe it or not, a typical TV on standby has as big a carbon footprint over the year as a typical person in Burundi. So turn it off, especially at night. And don't forget that chargers such as those for mobile phones or laptops use power even if the gadget is not connected. A good rule is that if the plug gets even slightly warm, it is using power. So unplug it.

Energy-efficient light bulbs? Of course. And even better, LED (light-emitting diode) bulbs are on the way. We can also save energy by sharing things – from car journeys to expensive kit that you don't use often, like power tools – and by recycling or selling stuff when we've finished with it.

As well as using less energy, we can try to use electricity that isn't made by burning carbon fuels. Many of us tap into the grid, so it can't be done directly. But some power companies offer green tariffs, where you pay a bit extra. They spend the premium on putting up wind turbines or whatever. But check what you are buying – you may just be subsidizing the electricity company to meet its legal obligations!

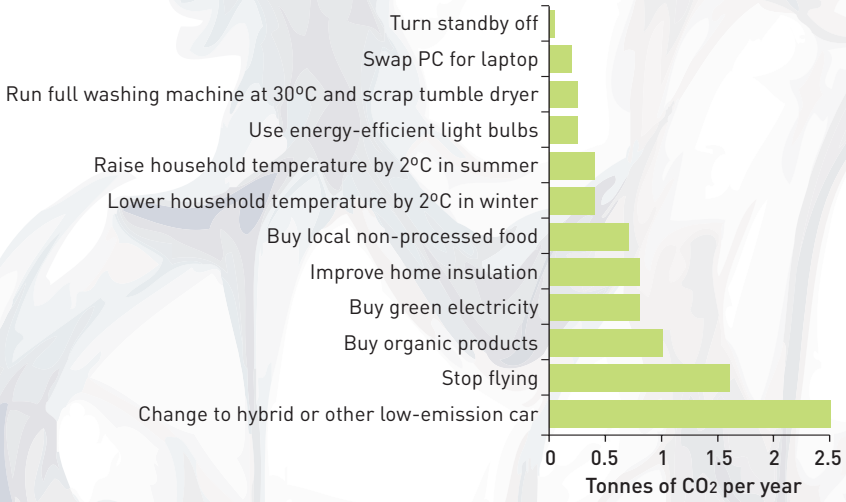
Don't forget food. Your diet may be responsible for a fifth of your emissions. Making fertilizer uses a lot of energy; so does transporting food around the world. Raising farm animals can be energy-intensive, too. And they produce methane, another global-warming gas. Buying organic avoids the fertilizer. Going veggie is good, though dairy products are no better in this respect than meat. Buying local cuts out the food miles.

In these ways, most of us can at least halve our personal emissions without really changing our lifestyles. There is one exception: flying. For people who take one or two short flights a year, flying is less than a tenth of their total emissions. But a return flight between, say, Europe and the United States of America will make you responsible for the same emissions as running a car all year. For frequent fliers – whether jet-setting business people or those addicted to bargain breaks on budget airlines – air journeys are much their biggest contribution to warming the planet.

If you have to fly, then check out the companies that for a few extra dollars will offset your emissions by planting trees or investing in green energy like wind or solar power. This is second best, but if you fly, you should do it.

Of course, all this will only work if millions of us act. But millions of us now care about the climate. So we could. We should. And, as the doctor said, it won't hurt that much.

Potential CO_2 savings **YOU** can make



Unlocking the future

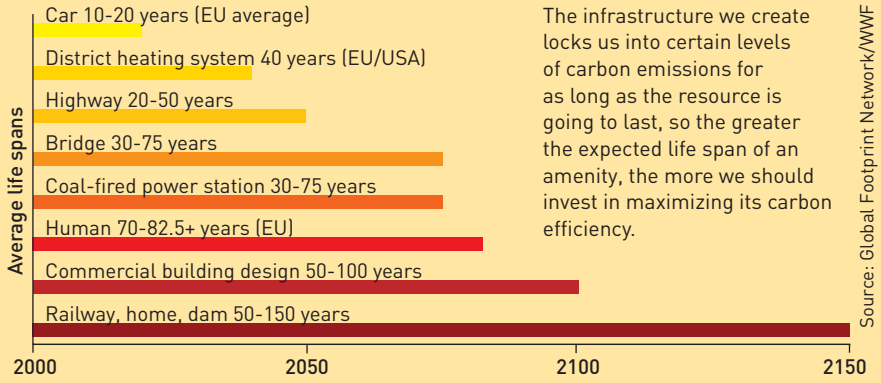
During the Oil Age of the last half century, the world became hooked on cheap oil. Worse, it has acted as if it would flow forever, locking us in to a future of high consumption, although increasing scarcity and growing climate change are rapidly dictating otherwise.

Out-of-town shopping centres that require cars and stifle local high streets, the concentration into fewer and larger hospitals and schools, the proliferation of motorways at the expense of rail, the building of coal-fired power stations – and many other outdated policies – all hamper personal attempts to kick the carbon habit. A decision to walk or bicycle is frustrated, for example, if the nearest shop, school or doctors' surgery is too far away. And every time an energy-inefficient new building is put up, a new airport is constructed, or a new fossil-fuelled power plant is built, the high-carbon infrastructure is perpetuated for the many decades of its future useful life.

So besides individual action to shrink carbon footprints, there has to be a bigger effort to decarbonize national and regional infrastructures. Several countries have made a good start on one of the most effective ways of doing this, promoting the spread of decentralized renewable energy by offering households generous 'feed-in' tariffs for any surplus electricity they generate and can sell to the grid: they have helped Germany, for example, to become the fastest-growing market for solar cells in the world – in 2007 alone it installed more than the United States has done in its entire history.

Other measures include policies to revive high streets, open local schools and clinics, revive pubic transport, build high-speed railways and encourage innovation to concentrate on making products for the very different world that will soon be upon us.

Life spans of people, products and infrastructure



Lights out

Few inventions have benefited humanity more than the incandescent light bulb. But almost 130 years since Thomas Edison first made it practical for widespread use in 1878, it is now on the way out.

'Incandescents use technology invented during the age of the steam engine,' says the Irish Environment Minister John Gormley. And they are just about as efficient. Only 5 per cent of the energy they consume is turned into light; most escapes as heat. The International Energy Agency estimates that a worldwide switch to efficient lighting would cut global electricity use by almost a tenth.

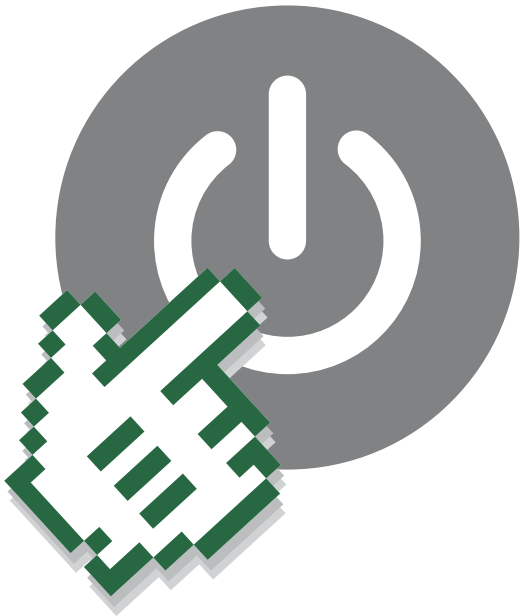
Ireland will phase them out by January 2009. Brazil and Venezuela, the first countries to announce a ban, will follow by 2010. Australia, Canada, the United Kingdom and the United States of America are not far behind.

For now, the most available alternative is the compact fluorescent bulb, or CF, which uses a fifth of the energy and lasts 10 times longer, saving the energy used in making new ones. Indeed they save up to 2,000 times their own weight in greenhouse gases.

But, in fact, they are likely just to be a staging post. Light-emitting diodes (LEDs), are even more efficient (developers plan to make ones 16 times better than traditional bulbs by 2010), last even longer than compact fluorescents and are likely to be illuminating the world before long.

Zack Pedrick

Flicking the switch on **STANDBY**



The TV remote control first appeared in the 1950s under the slogan 'Lazy Bones'. As technology was refined, over time, the little red standby light became commonplace – and welcomed as convenient. But now we are on standby overload: many appliances in our homes stealthily suck energy all day, every day.

Some manufacturers have all but eliminated an accessible, definitive 'off' feature. 'Idle', 'stand-by' and 'sleep' amount to the same thing – the appliance is still using electricity.

The world's standby products, using up to 10 per cent of household energy consumption, are together estimated to be responsible for 1 per cent of global CO_2 emissions. It's costing both us and the planet – financially and environmentally.

To make matters worse, our addiction to consumer electronics is growing fast. The European Union predicts, for example, that by 2020 British use of home entertainment products and computers could account for up to 45 per cent of home electricity consumption. Forecasts like this are spurring the EU to tackle standby: its 27 member countries recently adopted a framework directive on ecodesign in Energy-using Products that should stimulate a switch away from it.

And there are new gadgets to make it convenient to switch off. For example, remote controls have been introduced to switch off several devices at once – providing a modern eco-friendly retake on 'Lazy Bones'.

Q&A

Q. What sort of impact would the use of biofuels make in the bid to reduce CO_2 emissions? Is the balance between the environmental costs of their production and transformation on the one hand, and the reduction of CO_2 emissions on the other, a useful contribution?

A. Bioethanol and biodiesel were originally hailed by some as a way of both reducing emissions from cars and helping to diversify rural livelihoods, and Brazil has an impressive record of producing fuel from sugar. More recently, concerns have mounted that growing biofuels can cause the felling of forests, releasing more CO_2 than they save, and is driving up world food prices. Hopes are now focusing on a 'second generation of biofuels' using wood, grasses and other plants that grow on marginal land. Biofuels come in many forms, and we need standards and certification schemes to make sure that the ones we use are sustainable.

Q. Realistically, what are the chances that we will be able to keep climate change under the 2ºC threshold over the next 50 years?

A. It will be hard, especially as past emissions have already committed the world to an increase of 1.1ºC. But we have to make every effort to achieve this goal, as it is our best chance of avoiding dangerous climate change. And it can be done if governments and people set about the task with real urgency and commitment.

Q. There are lots of things going on with solar and wind energy. But why are there so few schemes aimed at harnessing tidal or wave power, and is there a future for using this renewable source of energy?

A. Solar heat and wind power are both relatively cheap forms of renewable energy, are distributed widely – and for free – by nature, and can be exploited on a small scale. So it is not surprising that they have been the first renewables to take off. Tide and wave power are restricted to relatively few places, and require much bigger installations. But, however belatedly, they are now beginning to receive serious attention. We will need them, as well as solar and wind power, if we are to meet our goals.

Q. Historically, a high proportion of global CO_2 emissions has been caused by a small number of industrialized countries. How can the behaviour of these countries be changed, and is it possible to stop developing countries from forming carbon-based economies?

A. The fact is that the developed world has a carbon-based economy, consuming enormous amounts of natural resources and generating vast amounts of detrimental waste, but that does not mean the developing world has to follow the same path. There is a better choice: an environmentally sustainable process with better economic and social outcomes. But it will only become a reality through partnerships, cooperation, investment and the transfer of appropriate technologies.

Q. We understand there has to be action on climate change, and that public participation is key to any realistic solution. Will UNEP play a role in this?

A. World Environment Day 2008 is devoted to kicking our carbon habit, and this is just one of UNEP's activities to increase public awareness and understanding of climate change, and to mobilize people to take concrete action. Others include our Billion Tree Campaign, which catalysed the planting of 1.5 billion trees in 2007 and was relaunched in 2008 to encourage the planting of another billion. UNEP has also started the Climate Neutral Network to help countries, cities and corporations achieve zero-carbon status and is taking the lead in greening the way the UN works.

Q. What practical things can everyone do to kick the carbon habit? And how can they ensure that governments and businesses do so too?

A. By leading by example and engaging in a lifestyle that will not compromise the ability of future generations to live a decent life, including recycling and reusing; changing to energy-saving appliances including light bulbs; switching off electrical devices; and walking, cycling and using public transport. Governments need our support to put policies to protect the planet in place. Businesses require consumer pressure to focus on environmental sustainability.

Q. How can developing countries with few resources play their part in the challenge of halting climate change?

A. The impact of climate change on the poorest and most vulnerable regions of the world is likely to be devastating. But developing countries must also act to tackle the causes of climate change, and minimize the consequences. The international community must help to build their capacity to meet the challenges through training, education and awareness-raising; sharing knowledge and expertise; providing tools for impact assessment; and, of course, with funds.

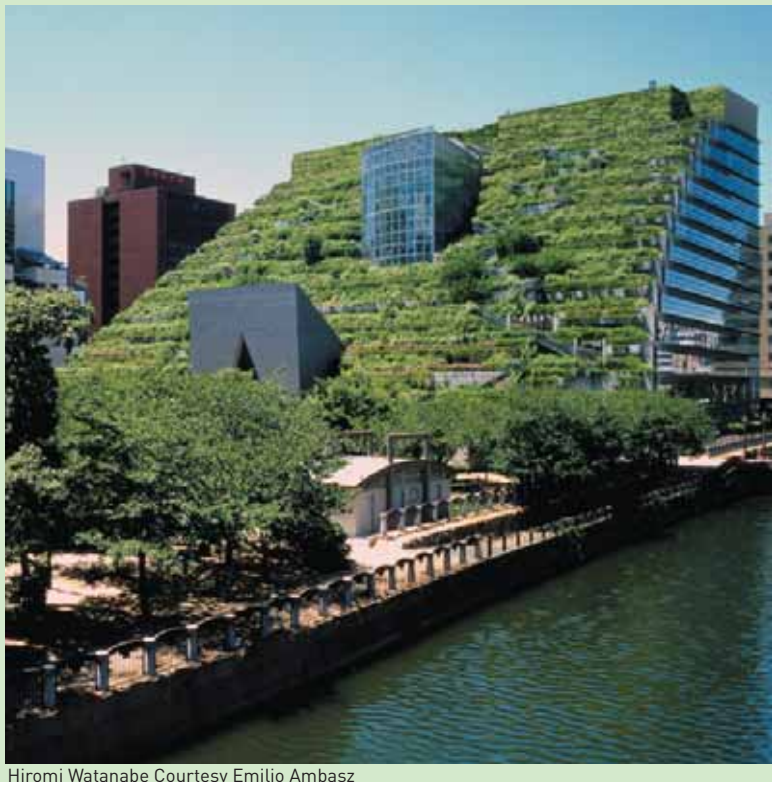
Green cities

Imagine a zero-carbon city with all its power provided by the sun, the wind and recycled waste – in a desert where summer temperatures hit 50°C. Its car-free streets are shaded, and its 50,000 residents whizz to work on a light rail system or in personal, driverless rapid transit pods – both emission free. Instead of power-hungry air conditioning, the buildings, all less than five storeys high, are cooled by wind towers that catch breezes while expelling heat. Ninety-nine per cent of the city's waste is used to make energy or compost, while residents use water desalinated with solar power and recycle all their waste water.

Far off in the future? No. This is Masdar – which the United Arab Emirates is about to start building on 7 square kilometres just outside the city of Abu Dhabi. Due to be completed in 2012, Masdar – 'the source' in Arabic – is aiming to be the world's first sustainable city, and a centre of clean energy research and development.

It is in a race with Dongtan, now being built near Shanghai on an island the size of Manhattan in the mouth of the Yangtze River, the first phase of which is due to be completed in 2010. The Chinese eco-city will produce its own energy from the wind and sun, biofuels and recycled city waste, and grow organic food. Cars will be banned from the city centre and public transport will run on hydrogen fuel cells. By 2040 it is expected to be home to half a million people.

Inkognitoh/Flickr



Hiromi Watanabe Courtesy Emilio Ambasz

CHANGE OF HABITAT

In 2008, for the first time, humanity will become an urban species, with half of the world's 6.6 billion people living in towns and cities. By 2013 those 3.3 billion urban dwellers will have grown to 5 billion. Even now, although cities take up only 3 per cent of the world's land, they consume 75 per cent of its energy and produce 80 per cent of its greenhouse gas emissions.

Yet cities offer great potential for sustainable living. As they are densely populated they can have efficient public trans-