



The UNEP Magazine for Youth

TUNZA



for young people · by young people · about young people

Going places?



Cars
Bikes
Buses
Planes
Trains



Go green – use sustainable transport

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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ISSN 1727-8902

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Printed in the UK

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**Partners for Youth
and the Environment**



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

A partnership agreement, originally signed in 2004 and renewed in 2007 and 2010, runs through 2013. It lays down the basis for UNEP and Bayer to implement the projects under the partnership. These include: TUNZA Magazine, the International

Children's Painting Competition on the Environment, the UNEP Tunza International Youth and Children's Conferences, youth environmental networks in Africa, Asia Pacific, Europe, Latin America and the Caribbean, North America and West Asia, the Bayer Young Environmental Envoy Program and a photo competition, 'Ecology in Focus', in Eastern Europe.

The long-standing partnership between UNEP and Bayer has become a public-private partnership that serves as a model for both organizations.

LET'S GET GOING ...



WE ALL WANT TO TRAVEL TO FAR-FLUNG PLACES or to the sun for a holiday. We all value mobility – getting to work, going to the shops, the cinema, or visiting friends and family. And like it or not, we all buy things produced in far corners of the world, whether it's a bike, a pair of trainers, tennis balls or a cup of coffee. With food, most of us aren't willing to stick to the seasons either, so goods criss-cross the equator on boats, planes, trains and trucks.

That all takes resources – the metals to make the vehicles, the oil or gas or coal used to power their mining and manufacture, and the fuel we use to run them. Then there are emissions and other pollution – from particulates and black carbon to noise.

But there's nothing as unpopular as suggesting that people should give up a long dreamed-of trip, or do without their car. Try suggesting that we only eat and drink locally produced seasonal foods. That could mean no coffee or tea, no oranges, lemons and bananas. None of us want to be grey kill-joys rather than inspirational greens.

But we have to change, and we have to persuade others, too. So do we just try to set an example in our own lives, or do we set up and run a local project, or do we lobby our politicians? Yes, yes and yes! We all can do something.

It might mean thinking about what we buy from far, far away, when there are perfectly good more local options. That'll mean looking at labels.

It might mean organizing a campaign, like the Volvo Adventurers from the UK, to get people to check their car tyres regularly and inflate them properly. They'll save fuel, reduce their emissions, and the tyres will last longer.

Or how about setting up a bike club to get more of your friends and colleagues to ride to school or college? Or get together with your community to establish a Ciclovía in your city. It'll improve your fitness, as well as being fun.

What about setting up a vegetable garden in your school or community, and growing some of your own food? There's nothing more satisfying, so teach others, too.

You could get together with your friends to work out how public transport in your area could be made better, more affordable and accessible – then lobby your local authorities and operators to implement your ideas.

And when it comes to your leisure time, become a tourist in your locality. You'll be surprised by things you didn't even know exist!

You won't be on your own. Around the world people are researching, innovating and taking action – from other young people to car makers, train operators, airlines and city planners. So let's all get going.



Young adventurers

HOW CAN WE CUT OUR CARBON FOOTPRINT, reduce waste and help our community adapt to climate change? We've all had these thoughts, but what have we done?

VOLVO ADVENTURE, which started in 2001, encourages young people to HAVE A GO! This year, more than 400 teams from schools, youth groups and conservation clubs embraced the challenge, and the eight finalists assembled in Gothenburg, Sweden in June 2013. As Volvo's Erica Wikman told Tunza, 'I'm inspired by the young people's ingenuity in finding innovative solutions. They fill me with hope!'

1st PRIZE Feeding people, minimizing waste, conserving corals

STUDENTS at the Ecogarden Club of Penjaja Pulau Community, Indonesia saw that marine litter and other waste from their island community was damaging nearby coral reefs. With dwindling fish numbers on the reefs, fishing boats are travelling further out to sea, raising safety concerns as extreme weather is increasing.

Using organic waste collected during clean-ups, the young people made compost to establish an 'ecogarden'. They used other rubbish, including plastic waste, as containers and components in their irrigation and composting systems. Their garden is open to the public, so islanders can learn horticultural techniques and get seeds for growing and selling their own food – providing the fishing communities with an alternative, sustainable food and income source.

Contact wahyusanjayaeco@gmail.com for more info.

2nd PRIZE Check those tyres!

YOUNG INNOVATORS from Newland House School, Twickenham, UK have come up with a common-sense approach to tackling the unnecessary waste of fossil fuels and carbon emissions – check your vehicle tyres!

Correctly inflated tyres can reduce fuel consumption by 4 per cent and extend tyre life, but most drivers don't check their tyres regularly – if ever. The kids first tested the efficiency of tyre valve caps that illuminate when the pressure is too low and then set about changing driver behaviour through an awareness campaign run in cooperation with the Sainsbury's supermarket chain – a major fuel provider. The boys also lobbied political leaders, including the UK's Minister of Business, Innovation and Skills. The idea is so simple, cheap and effective, it could and should be replicated everywhere!

If you think you could do something similar, contact barry_mcgovern@hotmail.com for more details.

3rd PRIZE Go renewable!

AS IF installing their own wind-turbine to supply their school with its own energy wasn't enough, Camden Hills Regional High School's Windplanners (USA) had to raise the necessary funds from amongst a sceptical local community. Nevertheless, they succeeded in raising some \$516,000.

The turbine currently supplies 10 per cent of the energy the school needs and the aim is to raise that to 20 per cent in the next five years. As they still had some personal energy left, the students carried out an audit to see where the school could save energy.

The team was commended by Naomi Poulton, Deputy Director of UNEP's Communication Division, for 'demonstrating how, through persistence, education and awareness raising, a local community can be persuaded to change attitudes and behaviour to embrace sustainable energy solutions'.

Interested? Visit: www.fivetowns.net/subsites/windplanners.

TUNZA PRIZE

So simple, totally compelling

The Volvo Adventure TUNZA Small Beginnings Award for projects that can grow to make a considerable difference to sustainability went to Sishu Griha Montessori and High School of Bangalore, India. They demonstrated how reducing the brightness of a computer screen or monitor could, magnified across the world, significantly reduce energy use and global CO₂ emissions.

Setting the brightness at 40 per cent (you'll hardly notice the difference) saves 33 per cent of the energy used at 100 per cent. Adjusting 3,000

computers, the students calculate, would save enough energy to power one Indian home for a month. Now think – there are 17.5 million computers in India, and turning them all down would save 125,000 tonnes of carbon emissions a year; take it worldwide and that saving rises to 7.8 million tonnes.

The team is ready to share its blueprint of how to launch a campaign in your school, college, club or company – and then spread it to others. It REALLY could make a difference, so contact rao.settigunte@gmail.com.



Banson



Challenge finalists



STUDENTS FROM HRISTO BOTEV SECONDARY SCHOOL, BULGARIA are organizing waste collections in their community, its separation and the composting of biodegradable elements. This is used for the school's organic vegetable garden, but the students are also teaching local farmers to compost and improve their soils.

FIJI'S KIA DISTRICT SCHOOL REEF RANGERS are working to conserve the island's coral reefs – some of the most spectacular in the world. They hold beach clean-ups and tree-planting events, while their contribution to an EcoFestival has

resulted in greater awareness of marine conservation in their community.

PERU'S YOUTH GROUP HUMEDALES DE PUCUSH UCLO OJO DEL MUNDO is running an ambitious project tackling climate change and biodiversity loss through wetland restoration.

PUPILS AT THE ÖZEL PENDIK İKBAL ANADOLU SCHOOL IN TURKEY run a thoughtful project to restore the harmony between people and nature by nurturing and raising awareness about one of the longest-lived symbolic trees – the olive.

Banson

What matters most?

WHAT DO ENVIRONMENTAL PROFESSIONALS THINK? TUNZA asked Erica Wikman, Volvo's Director of Sustainability Communication, and Annika Fredgren, Volvo Cars' Environment Manager what they think.

What do you think are today's greatest environmental issues?

EW: Climate change, of course, and water is also extremely important. All people have the right to a clean environment, access to water, healthy food and safe living conditions. The tricky bit is that we'll all have to change our lifestyles to be more sustainable.

AF: And we've all got to get smarter and more efficient in how we use resources. That includes lowering our burden on the climate. It's a big challenge.

What part do you feel that industry can play?

EW: The most important thing for any industry is to take responsibility and act for the long term. That's the core problem.

AF: Absolutely. It means collaboration, too ... between companies, academics, policy makers and people to find the best and most efficient solutions to making sustainable and long-term development possible for everyone.

What are the most important things that young people can do to contribute?

EW: Be wise! Consume less, reuse and recycle more, and think sustainability in everything you do.

AF: Talk to your family, teachers and friends about how important it is that they think about how they're impacting the environment and the world they'll leave YOU!

EW: And – become engineers and help develop sustainable solutions for the future!

The **SHIPPING** news

WHEN WE THINK ABOUT TRANSPORT

and carbon emissions, we typically point an accusing finger at air travel. Shipped bananas are greener than air-freighted avocados, right? Hmm ... it's not so simple: the global shipping industry, which transports about 90 per cent of world trade, actually has nearly twice the carbon footprint of aviation – nearly 1.2 billion tonnes of carbon a year, or 4.5 per cent of all global emissions. According to a recent UN study, it's a figure almost three times higher than previously thought. So we can no longer pretend that anything we buy from far away – including raw materials embedded in products – doesn't contribute significantly to global warming.

The problem has largely been invisible because the emissions occur in international waters – and therefore haven't been included in national carbon counts – and shipping is subject to fewer stringent environmental laws than land transport. These problems are now being addressed by individual countries and shipping companies, with the guidance of the International Maritime Organization, the UN agency responsible for shipping. Change on a global regulatory level is slow, but some initiatives – like innovation aimed at reducing emissions, voluntary classification schemes that take measures to reduce shipping's environmental impact, and environmental education and training in the shipping industry – all help.

Korionov/Dreamstime.com

Impacts on health

CONTAINER SHIPS EMIT POLLUTANTS including nitrogen oxides, sulphur oxides, particulate matter and black carbon that both contribute to climate change and damage human health – leading to up to 60,000 premature deaths a year in the USA, and 39,000 in the European Union – through related cancer, heart disease and asthma. This health impact is greater than that posed by cars – it's calculated that 15 giant tankers emit the same amount of pollution as all the cars in the world.



Invaders and beyond

COMMERCIAL SHIPS can carry invasive plants, animals and pathogens around the world in their ballast water: one estimate suggests that 10,000 marine species are transported around the world every day. Grey- and black-water discharge, oil and fuel spills also damage ecosystems, while chemicals used to prevent organisms like barnacles sticking to hulls are also considered toxic. Even noise associated with ship traffic can have a negative effect on marine habitats, and is of growing concern.

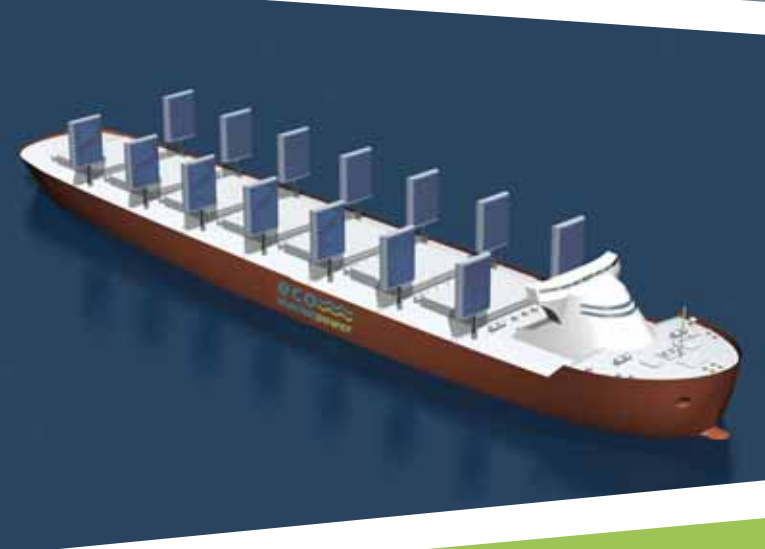
Absolute rubbish

IF YOU'RE A RICH COUNTRY with too much waste, what do you do? Export it, of course! More than 20 million containers of waste are shipped annually out of the European Union, and in 2011 the USA exported 23 million tonnes of scrap. Most goes to China, where it has value as a resource to be reused. Chinese container ships to the West return to China filled with metals, paper, plastics and electronic waste.

Recycling should be an environmentally good thing, but transporting waste around the world isn't. The ultimate answer is to reduce the amount of waste we generate and improve local recycling systems. In fact, China has recently enacted Operation Green Fence, which strictly regulates the quality of waste it will accept, turning back containers that have too much unrecyclable or substandard material. Each country should ask itself: are we ready to handle our own waste?



Skysails GmbH



www.ecomaritimepower.com

Into the future

ARE THERE GREENER WAYS to move stuff? In the past, when ships were totally wind-powered, it took the fastest ones just 21 days to get from Sydney, Australia, all the way to London! So what's shaping up for the future?

SKYSAIL is essentially a kite that tows a ship, boosting its propulsion to supplement traditional fuel. In good conditions, it provides up to 2,000 kW of supplementary pulling power, lowering fuel costs and really reducing emissions.

HYDROGEN FUEL-CELLS are being trialled, too. The *Viking Lady*, a Norwegian merchant vessel, runs on a hybrid energy system, reducing fuel consumption by more than 20 per cent. In a demonstration, a 330-kW, zero-emissions fuel cell was installed and ran the vessel for almost 10 months.

AQUARIUS ECOSHIP – still in development – features rigid sails, waste heat recovery systems, solar panels and computer control systems. Such innovation holds promise both for retrofitting old vessels and for integrating into new ship production.

Slow down!

WE ALREADY HAVE SPEED LIMITS for land transport that reduce fuel use: mandatory limits on European trucks have reduced emissions by up to 11 per cent a year, while in the USA, an emergency national maximum speed law, enacted during the 1974 oil crisis, set a speed limit of 88 km per hour, saving 175,000–275,000 barrels of oil daily. So why not ships? According to a 2009 study, ship emissions could be reduced by up to 70 per cent if speed were halved. Slowing ships down when near land would also have positive health effects, reducing pollution. And slower ships mean fewer collisions with marine mammals and other ships.

Scanrail/Dreamstime.com



Need versus want

WE ALL BUY GOODS made with raw materials from a faraway place, assembled somewhere else, then transported long distances to our home town. But is that really necessary? We can't remove every foreign product from our lives – and we do want to support the global economy – but it would help to consider what local produce we could buy and use. Water is a glaring example, so too are fruit, vegetables, cheese, wine and beer. Locally produced clothing and building materials are available too. So, if there's a choice – go local!

'Baby you can drive my car...'

CARS ARE WONDERFUL – used with care. Over long distances and full of passengers – they offer convenient, affordable and energy-efficient travel. But much of our car use is wildly inefficient: more than 80 per cent of European drivers' journeys average less than 20 km, while in the UK, more than a quarter are just over 3 km, and most are in towns or cities.



Ginasanders/Dreamstime.com

What about electric cars?

Otherwise known as EVs, electric vehicles have no exhaust emissions, and electric motors are up to four times more energy efficient than combustion engines. Sales are rising, with annual global trade projected to reach 3.8 million vehicles by 2020. Of course the environmental benefits depend on power sources: EVs beat conventional vehicles when it comes to greenhouse gas emissions if the grid is fed from a mix of conventional power sources and renewables – even taking into account their energy-intensive manufacture.

At the moment, EVs are expensive, running out at \$35,000 or more. But your investment is offset by lower fuel and maintenance costs, car tax exemptions and, in some cities, free parking. And government subsidies are also helping buyers: in the UK, you get a government discount of 25 per cent of the vehicle's cost, up to around \$7,600. Similar subsidies and tax exemptions exist in the USA, where some states offer hefty subsidies on top of federal grants; and in China, India, Japan, Sweden and other European countries.

Range anxiety

EVs are fine for short journeys, when you can charge your car at the wall at home between journeys, but most EVs currently only have a range of around 100 km. Fortunately, public charging stations are proliferating; according to one study, the number of EV charging stations around the world will grow from 135,000 in 2011 to 10.7 million by 2020, with the fastest growth in the USA, China, Japan and Germany. Then there are handy apps to help like ChargePoint, which allows drivers to locate nearby charging stations and plot routes over long distances.



Zap!

Recent developments mean that electricity can be transmitted wirelessly over several metres, through wood, brick and concrete. WiTricity – a company developing wireless recharging technology – thinks that the EV industry will actually be one of the first to be transformed by the innovation. If a coil to receive power wirelessly were embedded under cars, recharging could be as simple as parking, or even driving: the Republic of Korea is experimenting with power pads on bus routes, while in Europe the possibility of embedding wireless power in roads is being researched.



YOUR CHOICE?

Nissan Leaf: the first mass-market EV features a battery that can be recharged at the wall in four hours. Top speed: 144 kph, range 127 km.

Mitsubishi i-MiEV: one of the smallest EVs based on a Japanese microcar. It can travel 99 km on one charge, but recharge takes seven hours.

Fiat 500e: You can recharge this battery-powered version of the popular Fiat 500 in just four hours, go 140 km on a single charge, and zip around at up to 135 kph. Recently launched in California, the 500e has already sold out its entire 2013 run.

Honda Fit EV: a compact with a 131-km range, rechargeable in three hours. Currently only available for lease in certain cities, including Los Angeles and San Francisco.

Tesla Model S: a luxury EV with a 257-km range that can be recharged in 30 minutes. Great performance, too – 0–96 kph in 4.4 seconds with a top speed of 214 kph. Tesla expects to have charging stations within reach of 80 per cent of the populations of the USA and Canada by 2014, and 98 per cent by 2015, making it possible to drive coast to coast.



Nissan Leaf



Mitsubishi i-MiEV



Fiat 500e



Honda Fit EV



Tesla Model S

Where are hybrids going?

The **VOLVO D60** plug-in electric-diesel hybrid runs on electricity in the city. Diesel kicks in if you need more power or if your electricity runs low. The hybrid fuel consumption is 1.8 litres per 100 km – and the CO₂ emissions of 48g/km are half any other road car and the lowest of any non-electric vehicle.

PEUGEOT CITROEN is also working on a hybrid car, to be released in 2016. While it won't be as fuel-efficient as the D60, the vehicle will get 80 per cent of its energy from regenerative braking while driving in the city.



Whatever happened to hydrogen?

ZERO-EMISSION HYDROGEN CARS have long been the holy grail for green car dreamers, but hydrogen requires more energy to produce than is returned by the fuel. So hydrogen only makes sense in places with plentiful renewable energy – such as geo- and hydropower-rich Iceland or the Shetland Islands, where plentiful wind enables leading-edge hydrogen development.

Nonetheless, car makers are still pursuing the dream. In June 2013, **HYUNDAI** released the first 15 of its ix35 Fuel Cell cars – the first mass-produced hydrogen-powered vehicles to be introduced in Europe – to the city of Copenhagen, to aid its bid to become carbon neutral by 2025. The launch coincided with the installation of a compact, easily set-up hydrogen fuelling station by H2 Logic. It was installed in just 48 hours, demonstrating that deploying hydrogen infrastructure can be cost-effective and quick.





Modern magnets

Madrabothair/Dreamstime.com

CITIES ARE MAGNETS. Densely packed, they're a hive of trade, learning, entertainment and innovation. More than half of us already live in towns and cities – and by 2050, it's projected that at least 70 per cent of us will be urban dwellers. But cities consume disproportionately – using 75 per cent of the world's resources and producing 75 per cent of its waste.

Some argue that it's too late to transform today's cities – we simply can't pull them down and rebuild them. But we can plan carefully, renovate where possible and bear in mind the lifespan of infrastructure when we create it. A road lasts at least half a century, a house or an office for at least 100 years, and a railway up to 150 years.

How can we invest in infrastructure and systems that reduce our impact on the planet over time? The good news is that there are solutions for existing cities – encouraging density and fighting sprawl, and making cities greener, more pleasant places.

First, we can work to provide playgrounds and parks, shops, markets, housing, schools, medical facilities, workplaces and entertainment all within comfortable distances one from another, rather than spread around in ever-increasing sprawls requiring cars to access

them. Development of such condensed neighbourhoods in existing cities would mean reducing traffic, enabling parking lots to be transformed into parks, and existing roads into walkways or bike tracks.

Bike infrastructure goes beyond painting a line along a busy road – the best designs include wider lanes, adequate storage facilities at destinations, bike-share programmes, plenty of repair shops, and even shower facilities for cycling commuters. Copenhagen, one of the most bike-friendly cities in the world, has timed traffic lights on its suburb-to-city routes so that cyclists travelling at a steady 12 kph never hit a red light!

By investing in innovative bus and rail systems, making them more user-friendly, efficient and faster, we could also build fewer roads. Asphalt reduces the Earth's ability to absorb water, causing run-off and flooding and harming watersheds. It also creates so-called heat islands, which in turn increase energy demand for air-conditioning. Even such simple innovations as signs that gives waiting times for public transport have been shown to make a huge difference.

As for fighting sprawl, why not start transforming suburbs into self-contained mini-cities with employment, shops, services and entertainment all within walking distance?

Change IS possible!

MEXICO CITY, long known for its pollution and congestion, is hardly the first city to spring to mind when thinking of sustainability. Yet in 2012 Mexico City won the Sustainable Transport Award from the non-profit Institute for Transportation and Development Policy (ITDP). This was a huge feat – in 2011, Mexico City had rated worse than 19 other cities, including Beijing and Nairobi. What changed? The authorities made a concerted effort to fight the growing fleet of more than 4 million cars, adding new bus corridors connecting its historic centre to the airport, 90 new stations and 1,200 new bicycles to its bike sharing service, Ecobici. It also banned cars from some narrow, congested streets to make room for pedestrians, markets and further dedicated bus ways.

Driving on fumes

IN A BID TO CUT DOWN ON TRAFFIC EMISSIONS, some cities are leading the way in powering public transport with biofuel made from recycled waste. For example, buses in the Scottish town of Kilmarnock are run on biodiesel made from waste cooking oil from the food industry and collected from local households – which receive coupons for travel in exchange. In Oslo, Norway, and Lille, France, buses are run on biogas recovered from sewage sludge, while in Linköping, Sweden, city buses are powered by biomethane made from local slaughterhouse waste as well as crop residues, manure and restaurant waste. This has improved the city's air quality, while local farmers benefit from the fertilizer created as a by-product of methane production.



Quiet down!

IT'S NOT JUST ABOUT DISTURBED SLEEP: noise is said to be the only environmental problem that can cause individuals to commit murder! Research shows that prolonged exposure to noise can raise blood pressure, create hypertension, diminish memory and impair cognitive development in children, too. In Germany, Düsseldorf's city centre had noise up to twice the recommended levels – with traffic the major contributor. The city has tackled this by introducing low-noise road surfaces and rail tracks, reducing speed limits, and restricting through-traffic in

residential areas. In Berlin, meanwhile, 120 parks are so polluted with noise that it diminishes their recreational benefit. Brakes and horns are obvious culprits, but 90 per cent of the noise is caused by tyres: one proposed solution is to pave roads with porous asphalt, which reduces noise by up to 5 decibels.

Car

Bike

Bus

How much space is needed to keep 65 people on the move?



Municipalidad de Rosario, Mexico

Travel & Transport

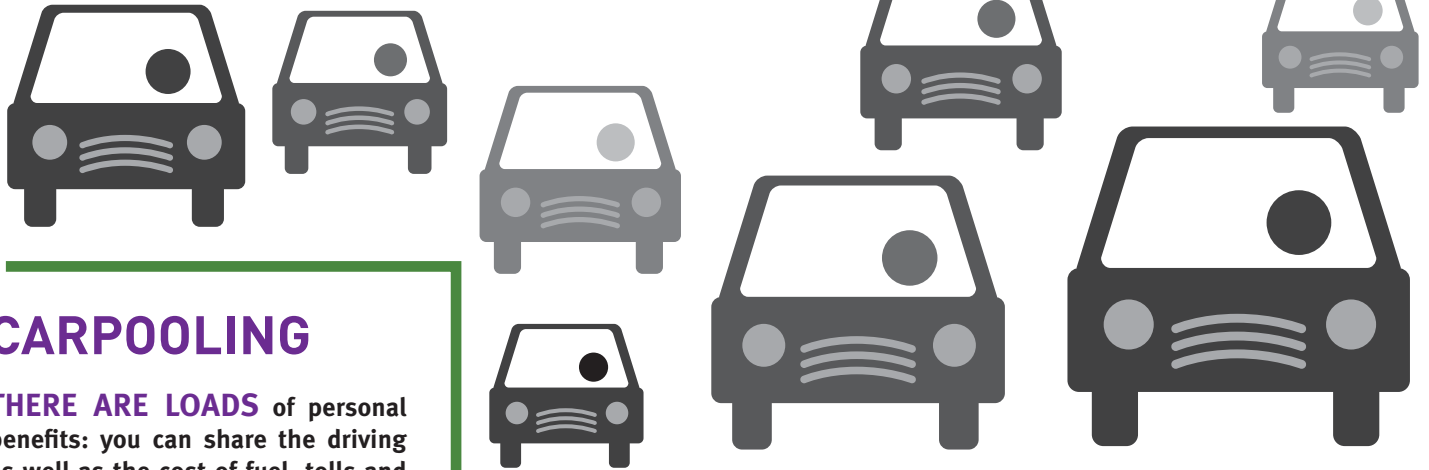
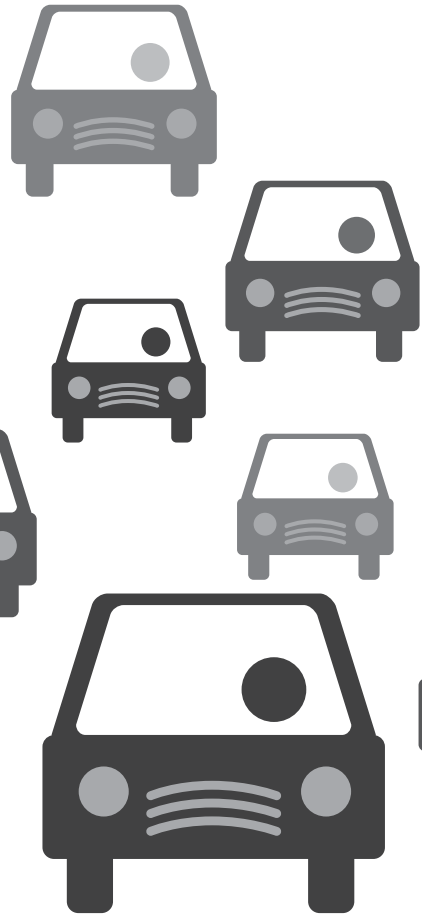
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Why not share?

ALL OVER THE WORLD, people are coming up with solutions to ease crowding, save money and clear the air by sharing rides, whether routine daily commutes, lifts across town, or longer road trips.



CARPOOLING

THERE ARE LOADS of personal benefits: you can share the driving as well as the cost of fuel, tolls and congestion charges, and there's less wear on your vehicle. Why not set up a carpool in your school, college or workplace? Here are a few things to try:

- 1) Put up a notice on a bulletin board with a column for rides wanted and rides offered. Make it clear whether you're willing to take turns driving, and whether you would like to receive or would offer money for shared fuel and toll costs.
- 2) For the biggest benefit, try to fill each car. If it's too much to drive to several different houses to pick people up, ask sharers to meet at an agreed place and time.
- 3) Set up an online carpooling system – there are many ready-made systems and most are locally based, so Google your area. If you are in the USA, Zimride is an easy-to-use application that allows you to set up a rideshare within your school, college or company. **Shareling.com**, **carpoolworld.com** and **Amovens.com** are online services that work all over the world either for commuting or for longer-distance travel.



CASUAL CARPOOL

SOME CITIES have carpool lanes that allow drivers into a fast lane and/or give them free passage through tolls. To take advantage of this, informal carpools have formed, matching passengers looking for rides with solitary drivers looking for passengers at a designated point. The popular system saves time and money in crowded US cities including San Francisco and Washington DC.



IS HITCHHIKING SAFE?

SCARE STORIES about criminal hitchhikers over the last few decades have put many people off the age-old tradition of thumbing a lift. Yet there's little evidence that hitchhiking is inherently any more dangerous than other forms of transport. While hitching is illegal in some states in the USA, and may not be common practice in your country, it's still an accepted way to get around, particularly where cars or trucks are the only form of transport. It's common practice throughout Europe, in Chile, Iceland, Israel, Oman and beyond. Some countries even help facilitate it – in Cuba 'Los Amarillos' (officials dressed in yellow) help match passengers to cars, while in the Netherlands and Mexico, your best bet is to ask for rides at petrol stations. For advice, visit <http://hitchwiki.org>.



Neko92vl/Dreamstime.com



TWEET-A-RIDE

IN LATE 2012, a matatu (minibus) strike in Kenya brought the whole country's public transport system to a halt. To help get people moving again, Simeon Oriko started a Twitter hashtag initiative that allowed anyone looking for or offering a ride to tweet with #CarPoolKE. Kenyan non-profit organization Ushahidi created a crowd map to capture and map the Tweets, making it easier for people to find each other. Though the strike is long over, the hashtag is still being used.

SHARE A CAR!

zipcar.
wheels when you want them

MOVE OVER, URBAN BIKE RENTALS... here come urban car rentals! If you only need a car occasionally, a car-share may be the answer. Companies like Zipcar allow drivers to subscribe and pick up a car parked nearby. The idea has been so successful that traditional large car-rental companies have started similar schemes. Meanwhile, peer-to-peer platforms like RelayRides.com allow car owners to rent them out to drivers in need.

City authorities are even getting in on it: Paris's Autolib allows people to rent an electric car for short one-way journeys, picking up a car from one kiosk and dropping it off at another. Daily, weekly, monthly and annual rates are available, from \$13 per day to \$188 for a year's subscription, plus \$6.50 per half an hour of driving.

APPTASTIC

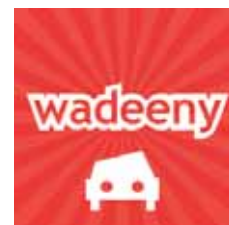
Avego: an iPhone app allowing you to find a ride or offer a ride in real time, on demand – and make small payments to drivers over the platform. Avego is available in many European and US cities, and the network is expanding. Visit the website to start it up in your area.

www.avego.com



Wadeeny: invented in Cairo but usable everywhere, Wadeeny is a secure and efficient way to arrange carpools and uses a credit service to allow riders and passengers to exchange money.

www.wadeeny.com



Ciclovía



BOGOTA, COLOMBIA, is a busy metropolis of more than 7 million people, around 1 million cars and more than 55,000 taxis and 18,000 buses. But every Sunday and holiday between 7am and 2pm, the city closes more than 112 km of streets to motor vehicles and opens them to cyclists, pedestrians, skaters and more – welcoming more than 1.5 million people who turn out to enjoy this reclamation of public space. Free dance, yoga and aerobics sessions are offered by trained teachers and free bike rentals are made available for residents who don't have their own.

This famous Ciclovía (which means 'bike path' in Spanish) has inspired many more cities around the world to follow suit, including Quito (Ecuador), Paris (France), Mexico City, Miami and San Francisco (USA), Lima (Peru) and many more.



MacAllenBrothers/CC-BY-SA 2.0

Try it!



FOR A HAPPIER, HEALTHIER

and more community-minded city, why not try a Ciclovía in yours? The *Ciclovía Recreativa Implementation and Advocacy Manual* offers a teaching guide that sets out the steps necessary to plan and establish a formal, city-approved Ciclovía

wherever you are, including tips for setting up an advocacy group, getting the support of your mayor or governor, appointing a project leader and raising funds. <http://cicloviarecreativa.uniandes.edu.co/english/index.html>.

If you'd like to try a car-free day on a less formal street level, form a neighbourhood committee to arrange closure of the street for one day, and brainstorm ideas for activities and entertainment. Some ideas: set up a stage and invite local



Miguel Angel Ramirez/IDRD/Columbia



www.cyclovations.org



musicians to play, have neighbours set up tables to sell or swap stuff or sell refreshments, and advertise to the rest of your town or city to walk or cycle down and have car-free fun! And if you do, please send us photos and videos!

Car-free day



WORLD CAR-FREE DAY is 22 September. Every year on that day, people around the world gather in their local streets to remind us that we don't have to be enslaved to cars. Going without a car for only one day out of 365 isn't really going to make a big difference, but it's a great way to celebrate non-car travel alternatives. And it might inspire you to commit to going car free once a month, then build up to one day a week, and then maybe even more. You might be pleasantly surprised at how easy it is!

To find out about World Car-free Day activities around the world, visit www.worldcarfree.net. In English, Czech, French, German, Italian, Portuguese and Spanish, the site has news about car-free activism and events around the world, resources for organizing events and petitions, discussion lists and more.

Share and share a bike

THOSE NEW YORKERS – they can get grumpy about anything! The latest is the recently launched bike-share programme, Citi Bike. You'd think a city so famous for its congested streets would be thrilled to get people out of cars and into bike lanes. But negative commentary includes complaints that the bike racks take up too much space, and the number of bike accidents on the road will go up (so far, there has been one accident involving a Citi Bike). Nonetheless, the scheme seems to be quite popular – 2,765 people turned out to test the new bikes on the first day, a promising start despite the controversy.

Meanwhile, **SOUTH KOREANS** seem to have a jollier attitude: a recently opened bike share scheme in Chongwan is dubbed NUBIJA – an acronym for Nearby Useful Bikes, Interesting Joyful Attraction. As part of its green economy efforts, the Republic is also building a 3-metre wide cycle path from Seoul to circle the entire country.

No gear? No problem! One common concern about city cycle shares is that tourists and occasional riders are unlikely to own helmets. Boston solves the problem with solar-powered vending machines that dispense helmets for rent.



Faster than a speeding bullet



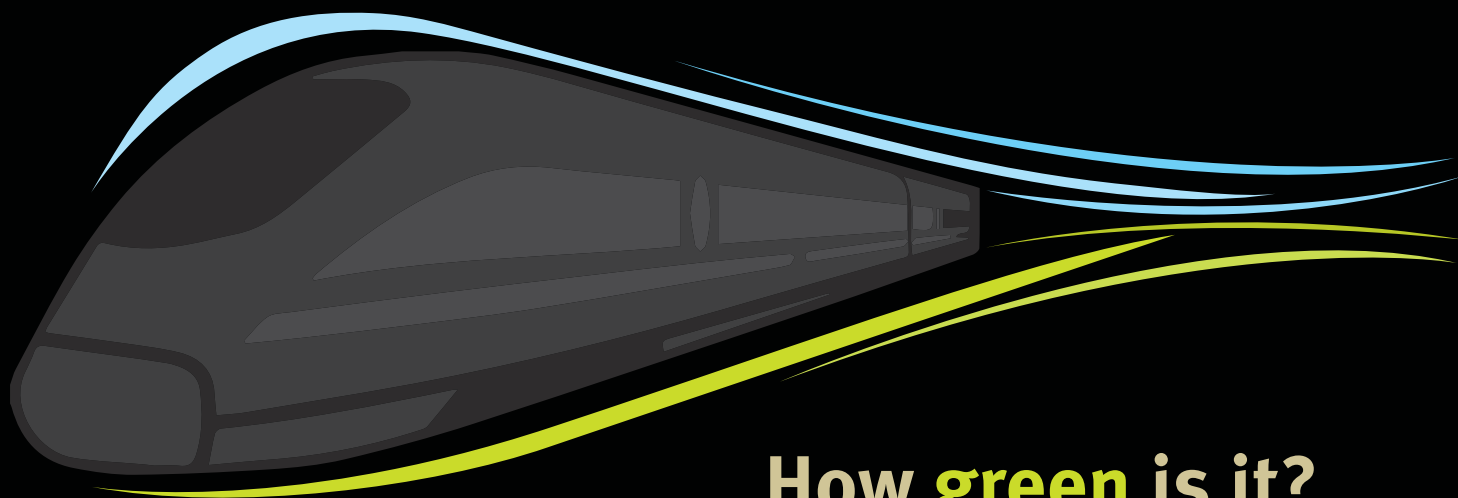
FOR DECADES, if you wanted to travel overland at more than 250 kph your only option was Japan's iconic shinkansen, aka bullet trains. They began operation during the 1964 Olympics, running between Osaka and Tokyo; then, in 1978, high-speed trains started running between Florence and Rome, in Italy. Slow to start, high-speed rail (HSR) travel is now booming as travellers grow tired of airport queues, security checks and traffic jams.

Today, shinkansen travel at nearly 300 kph over 2,414 kilometres of rail line. But now you can also get your speed thrills in 13 countries from China, France,

Germany and Spain, to Turkey, the Republic of Korea and Belgium. By the end of 2011 there were 17,000 km of high-speed track around the world, another 8,000 km under construction and a further 18,000 km planned.

By 2014, high-speed rail will be running in 25 countries including India, Morocco and Mexico. Turkey is rapidly developing its network and plans to rival Germany in its length of track. Even the USA, infamous for slow trains and ageing infrastructure, is getting in on the act with President Obama announcing an \$8-billion stimulus to develop 13 major intercity high-speed rail connections.

Gsagil3/Dreamstime.com



How green is it?

High-speed rail runs on electricity, with lines in Japan and Europe releasing just 30-70 grams of CO₂ per passenger per kilometre travelled. In contrast, car travel generates 150 grams and flying 170 grams.

Bullet, yes; silver bullet, no. Building the infrastructure and trains requires energy, and while electric trains are certainly cleaner than trains run on diesel, the technology can only be as green as its power source. Still, this form of transport is ready to make good use of renewable energy sources – geothermal, hydro, solar and wind – as these come online.



www.mobility.siemens.com

How do they do it?

HOW CAN HIGH-SPEED TRAINS GO SO FAST? It's all in the design: tracks are relatively straight so that trains do not have to slow for turns; the rails are welded to concrete rather than using wooden ties, reducing friction, and of course high-speed tracks do not have traffic crossings. Aerodynamic design is also important: the noses of shinkansen bullet trains mimic the beaks of kingfishers, minimizing drag and making the train quieter, faster and more energy-efficient.



lana55/Dreamstime.com

Into the (near) future

Hybrids

A new generation of braking systems is making it possible for trains to generate their own electricity – or at least some of it. US rail company Amtrak recently upgraded decades-old locomotives with a fleet of 70 new, highly efficient Siemens electric locomotives whose braking systems feed energy back into the grid. Meanwhile in Germany, a regenerative braking system is being tested on existing trains. If it works, it is hoped it can be applied to both electric and diesel trains, essentially turning them into hybrids.

Solar rail

High-speed rail travel is already a greener long-distance option than most, but powering trains with renewable electricity would make it more so. In summer 2011, a 3.2-km tunnel on the high-speed line between Paris and Amsterdam was covered in 16,000 solar panels. The electricity generated contributes to running Belgium's trains – enough to power all the country's trains for one day a year – as well as providing energy to Antwerp station. It's just a fraction of what it would take to power the world's rail systems with solar energy, but the technology is developing fast, and dropping in cost.

Hydrogen trains

The technology hasn't hit the big time yet – right now, the cost of fuel cells is too high. Researchers have been looking for ways to power locomotives with hydrogen since 2002, with the first successful demonstration in Canada. Then, in 2012, students at the University of Birmingham, UK, built and demonstrated a hydrogen-fuel-cell-powered locomotive at Stapleford Miniature Railway. Hydrogen shows great potential for rail applications such as trams, trolleys and short or rural lines, as these don't require as much power as high-speed rail. At the moment extracting hydrogen is just too expensive, but that may change as the use of renewables becomes widespread. Then surplus energy – for example from wind turbines working during the night – can be used economically. So, watch this space!

Natural gas

Trains still play a crucial, low-carbon part in shipping goods over land. Freight rail tends to run on diesel, as just 3.7 litres of diesel will carry a tonne of freight 395 kilometres by rail, versus 142 kilometres by lorry. But what if freight trains could be powered by natural gas that is otherwise flared – burned and wasted – from oil-producing plants and landfill sites? US rail company BNSF is looking into the idea, reclaiming waste natural gas and liquefying it to power locomotives. While natural gas is not as green and clean as electricity from renewable sources, the scheme would make good use of a non-renewable energy that would otherwise be wasted.

B2d/Dreamstime.com

Emission-free flight



SUN FUEL

When the **SOLAR IMPULSE** solar plane took its first international flight from Switzerland to Brussels in May 2011, it sparked the world's imagination about the possibilities of zero-emission travel. Since then, the single-person aircraft – manned by aeronaut Bertrand Piccard – has been flown from Spain to Morocco, and more recently across the USA, taking off in San Francisco and stopping in Phoenix, Dallas, Washington DC and New York City.

It's a huge feat to make an aircraft light enough to be powered day and night by the sun, requiring a careful balance of energy efficiency, weight and strength. The Solar Impulse relies on state-of-the-art materials – Bayer provided advanced materials including polyurethane rigid foams for the wing tips and polycarbonate film for the cabin window. The 12,000 solar cells covering the upper wing power four electric motors, as well as charging four lithium polymer batteries that allow the aircraft to fly at night – demonstrating that solar energy can be used as a reliable power source.

A new craft, the Solar Impulse HB-SIB, is being built to circumnavigate the planet in 2015: it will be the world's first manned, un-fuelled flight around the world. For that, a new high-performance insulation material has been developed to shelter the cabin as the aircraft faces extreme temperature fluctuations. 'Outside, it can be -50°C at night and $+50^{\circ}\text{C}$ by day,' explains Bernd Rothe, head of Bayer's Solar Impulse development team.

For Piccard, it's all about technical possibilities. 'If an aircraft can fly without fuel day or night, we can adapt this technology for our everyday lives – to heat, to cool, for lighting and in cars.'



Saniphot/Dreamstime.com



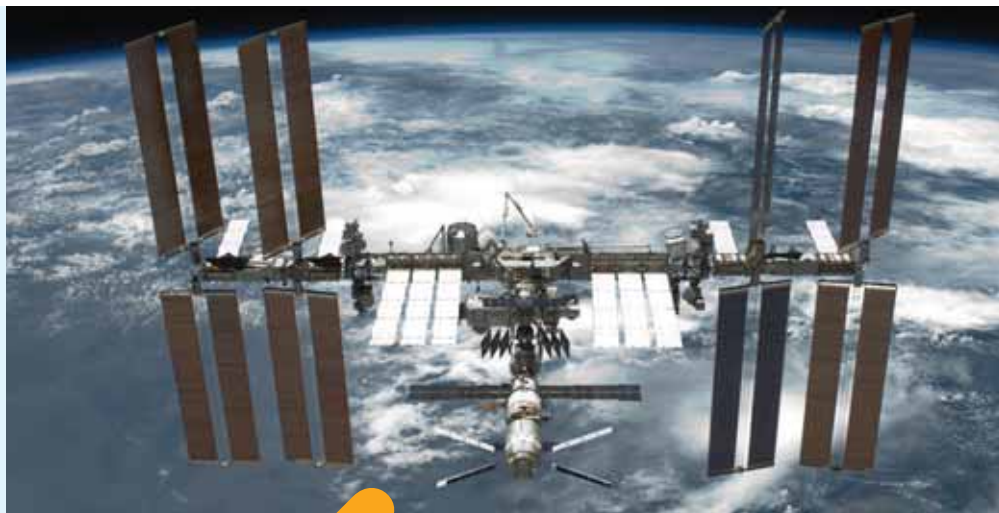
Jean Revillard/Rezo.ch

ROCKET FUEL

WHAT DO YOU DO when you need lots of energy in a place that's a long way from the grid? Plug into the sun, of course! Space was one of the first applications for solar power, and NASA has invested hugely in making solar technology efficient, light and strong – funding research that leads the way for the rest of us back here on Earth.

At the moment, the largest photo-voltaic (PV) system in space – a 32.8-kW array comprising four 34-metre-long wings covered in solar cells – powers the International Space Station's stationary systems. Now, NASA wants to further streamline space-based solar power for propulsion – replacing traditional kerosene- or hydrogen-based rocket fuel while allowing long-term, manned space flight to near-Earth asteroids and beyond with little or no need for fuel.

The agency has issued a call for proposals for PV array systems, starting with up to 50-kW systems to propel high-powered satellites, with the ultimate goal of 250-kW systems to propel spacecraft. This call is open to anyone with good ideas, from government agencies to educational institutions, industry and non-profit organizations. Winning designs will be put to the test in space! Could this be you?



NASA-S134-E-010137/PD

FAT FUEL

HELP KEEP PLANES IN THE AIR: EAT YOUR CHIPS!

Planes powered by biofuels made from used cooking oil are zooming towards mainstream reality. In spring 2013, KLM Royal Dutch Airlines launched a 25-week series of weekly flights between New York and Amsterdam fuelled with a mixture of chip-fat biofuels and petroleum-based jet fuel. KLM is betting that if travellers get enthusiastic about biofuelled journeys, market demand will help make biojet more cost-efficient and therefore commercially viable.

KLM isn't the first to demonstrate biojet. In the last two years, Qantas and AirCanada have flown demonstration flights using cooking-oil biojet. Thomson Airlines fuels some of its short-haul European flights with it, and in early 2013, a cooking-oil powered 787 Dreamliner flew all the way from Everett, Washington to Tokyo.

Cooking-oil biojet has the advantage of recycling waste, so it doesn't require agricultural land – a step in the right direction. But the truth is that all the recycled cooking oil in the world would only provide a tiny fraction of what's needed to fly the world's planes, so it's not a magic bullet. Some airlines are testing biojet fuels made from other feedstocks – including algae as well as jatropha, coconut and seed and nut oils. In support, the EU Commission and European airlines have agreed to produce 2 million tonnes of aviation biofuel by 2020, with the goal of reducing pollution while avoiding the use of food crops.



www.dreamliner-787.com

Robynmac/Dreamstime.com

Getting away from it all

WE ALL NEED TIME FOR REST AND RECREATION, and for many people, it's human nature to want to explore and enjoy the world around us. And the seemingly unstoppable rise of inexpensive plane journeys has made this possible for more and more people. In just one year, between 2011 and 2012, international arrival figures rose by 4 per cent to reach more than 1,000 billion. On the one hand, tourism helps drive the global economy – representing 5 per cent of the world's GDP and contributing up to 7 per cent to global employment. On the other hand, tourism has been estimated to contribute about 5 per cent of total greenhouse gas emissions, about 75 per cent from transport. The average tourist journey generates 0.25 tonnes of CO₂.

The good news is that we have choices that can help lighten the load. Here are just a few things to consider.



Martinmark/Dreamstime.com

Slow travel

THE SLOW TRAVEL PHILOSOPHY rejects rapid arrivals for the journey as its own reward – as well as staying in one place for at least a week, renting an apartment or villa rather than staying in a hotel, shopping and cooking rather than eating out, and encouraging taking time to get to know local culture and people. Flying flies in the face of slow travel, of course, so most slow travellers go by land or sea. The lowest-carbon option is the train, with coach and car following. Hitching a ride on a cargo ship already setting sail for your destination might be a green option, but note that commercial cruise ships are extremely carbon-intensive – not to mention the fact that they generate a lot of wastewater, oil-contaminated water and solid waste.

Slow-travel blogs to watch

Slow travel isn't just fun to do: it's fun to read about. Have a look at these slow-travel blogs and indulge in some low-carbon armchair travelling – from crossing the Middle East by train to cycling from London to Istanbul – or get inspired for a journey of your own! <http://bit.ly/1onvNr8>



Seat 61

NOTHING beats the romance and flexibility of travelling by train, and thanks to Mark Smith, aka The Man in Seat 61, there is a free online resource that will help travellers get from point A to point B via train (or ferry), to just about anywhere in the world – Africa, South America, Europe, Asia, and even journeys linking multiple continents! Visit his site and start planning now. As he says: ‘There’s more to travel than the destination. It used to be called a journey.’ www.seat61.com



Nathan D. Holmes/CC-BY-SA-3.0

Ready, set, offset!



SOMETIMES, you just have to fly, even though planes emit more greenhouse gases than any other form of transport. While we wait for renewable jet fuels to catch on and take off, think about offsetting the carbon emissions on your flight. One good place to start might be the German climate emissions organization Atmosfair. They’ve set up an index comparing the energy-efficiency of various airlines – including such practices as filling planes with passengers rather than flying half-empty aircraft – and offer ways to offset your journey through energy efficiency projects, environmental education and more. www.atmosfair.de



Photowich/Dreamstime.com



Edward Cooper

The staycation

ONE WAY TO KEEP EMISSIONS DOWN IS NOT TO GO VERY FAR – or don’t go anywhere at all. When was the last time you explored your nearby parks, woodlands and beaches? What parts of your city have you never visited – museums, theatres, restaurants, neighbourhoods? Have you ever sought out and tasted locally grown food, bought locally made products or visited local artists and artisans?

Chances are, you won’t have to go very far to find something entertaining and interesting within your area – and once you do, you’ll have a greater appreciation of where you do live! The staycation became popular in the UK in 2009, when an economic recession made foreign travel less affordable. Until then the number of Britons travelling abroad had risen by an average of 4 per cent per year for 25 years, then dropped from 69 million trips abroad to 58.6 million. Though this was bad news for foreign destinations, it was great for the British economy – channelling millions of pounds to local holiday destinations such as Scotland, seaside resorts and festivals.



A-Dedo



Young innovators

CHILEAN ARCHITECTURE STUDENT PABLO ALVÉSTEGUI saw a need for an online car-share platform to help keep the streets of Santiago greener, so he decided to do something about it. Now, the project he started while at university is a fully fledged, five-person company. The former Bayer Young Environmental Envoy 2010 tells TUNZA about how A-Dedo was formed, how it has grown, and his hopes for the future.

'TRANSPORT IS A MAJOR PROBLEM for all the main cities of South America. Traffic jams, the collapse of public transport and parking facilities, excessive time spent getting to and from work and air pollution are problems that affect the day-to-day lives of everyone living in our cities, regardless of age and cultural or socio-economic situation. Not only are there too many cars, they are used inefficiently, most often carrying just one person per journey.'

'When I was 20 and an architecture student living in France on an exchange programme, I used a ride-share service that worked by paying and registering in an office in downtown Paris, then ringing a number to arrange a ride. At the time, social networks and free online services were just becoming popular, so I thought perhaps I could create a similar system in South America – but on the Web – that would help people share rides easily and for free.'

'So when I got home, I founded A-Dedo (which means 'catching a lift' in Spanish) – a web platform that makes it possible for indi-

viduals and big enterprises to car-pool. Using the platform, people can share journeys in cars and taxis, economizing on fuel, reducing emissions and having a more enjoyable trip.'

'It started as a hobby when my friends and I were still students at the University of Chile: we designed and developed a public carpooling platform and launched the beta version on 5 June 2009, World Environment Day. We kept it online with the support of the university, and reached more than 6,500 users.'

'We saw that we were meeting a real need and making a big impact, too, but to keep up, we needed much more of an investment of time and effort to create a system that helps decrease pollution and traffic jams. So as we finished our studies, we started a business, writing up a plan that would support the public service we hoped to offer.'

'Four years on and we have now created a special service targeting enterprises, football clubs and institutions, helping them reduce their operational costs for transport and parking facilities for employees,

as well as decreasing overall carbon emissions. We have contracts with several big companies and universities that help us to hire the people we need to make a better version of our first platform and achieve our goals.'

'Our platforms have introduced innovations that differ from US and European carpooling services so as to target the cultural barriers to successful usage particular to Latin America – such as ways to integrate informality, punctuality and so on. We're still growing. Today, we're developing new applications for mobile phones and GPS that enable people to adopt better transport practices, such as using bikes, and in the case of companies, to optimize the use of their fleets of pickups, lorries and cars.'

'Our vision is to live in better cities – without air or noise pollution and with a more collaborative spirit. We want to help change these things for the better in other big South American cities, too.'

Please visit our web page <http://empresas.a-dedo.cl>.



Souped-up skating

THE ELECTRIC VEHICLE OF THE FUTURE is fully portable, can be charged in 15 minutes at a wall, and can run for 1,000 kilometres on a dollar's worth of electricity. Young entrepreneur Sanjay Dastoor and his friends came up with the idea of the Boosted Board while studying engineering at Stanford University, where they wanted an easier way to get around campus. The remote-controlled Boosted Board, currently in development, has a top speed of 30 kph (including uphill), has a 10-km range, and even features regenerative braking! All this from a vehicle that is made of components available from the toy store – the motor is normally used for model aeroplanes. But it's not just for fun – the Board uses 20 times less energy than an equivalent journey by car... and who needs to look for parking! www.boostedboards.com



Boosted Boards

Easy-breathe cycling

One health hazard of bicycling in a big city is having to breathe car fumes. In response, Beijing-based British artist Matt Hope has created a bicycle with a built-in pedal-powered air filter, piped in through a tube to a mask worn by the rider.

'The idea is to make people think about individual strategies to tackle problems,' said Matt. 'When something breaks, I try to fix it. The bike is me trying to "fix" the air.'

<http://matthope.org>

www.hugchina.com/Reuters





Putting fun into problem solving

By Ashley van Heerden

MILLIONS OF SOUTH AFRICAN CHILDREN walk to school every day and for many it can take up to three hours. That creates a barrier to learning. But 17-year-old South African Artemis Spyropoulos has spotted an opportunity for a simple, cost-effective, efficient and environmentally friendly solution. Her Scoot-2-School project started after she entered a national sustainability design competition ... and won with an innovative scooter design.

Made from recycled materials, Artemis' scooter could cut travel time to and from school by as much as 50 per cent. In addition to speeding up getting there, the scooter makes the journey easier because of its storage compartment. And Artemis has also taken on board the fact that resources such as school desks are a rarity in many schools – her scooter can quickly be opened out to form a desk.

The scooter costs less than \$2 to manufacture and is easy to maintain, making it easily applicable to other less-developed countries and even developed countries wanting to promote a zero-carbon school transport system.

Right now, Artemis and her team are working with potential sponsor Woolworths SA to get the scooter into production and then donate it to underprivileged schools. She's also collaborating with designers to create a 'do it yourself' scooter kit and manual.

Artemis is passionate about harnessing young people's energy to change the world through simple solutions that address the planet's most pressing problems. 'That's what Scoot-2-School is about – one design addressing social, environmental and educational issues at the same time,' Artemis told TUNZA, adding: 'What sets Scoot-2-School apart is its for-youth-by-youth approach. That empowers young people to be part of solving their own problems. And I am also determined to bring the fun back to problem solving.'

Ashley van Heerden is a Tunza Youth Advisor for Africa.

Photos: Artemis Spyropoulos

