GLOBAL WARMING

51 Things We Can Do to Save the Environment

Can one person slow global warming? Actually, yes. You—along with scientists, businesses and governments—can create paths to cut carbon emissions. Here is our guide to some of the planet's best ideas.

1. Turn Food Into Fuel

By Alice Park

Are corn husks better than corn for producing energy? Ethanol is the alternative fuel that could finally wean the U.S. from its expensive oil habit and in turn prevent the millions of tons of carbon emissions that go with it. The Department of Energy has doubled its 2005 commitment to funding research into biofuels—any non-petroleum fuel source, including corn, soybean, switchgrass, municipal waste and (ick) used cooking oil. Already, half of the nearly 11 billion bushels of corn produced each year is turned into ethanol, and most new cars are capable of running on E10 (10% ethanol and 90% gas).

Yet the eco-friendly fuel is beginning to look less chummy of late. Some of the 114 ethanol plants in the U.S. use natural gas and, yes, even coal to run the processors. And ethanol has to be trucked. Existing gas pipelines can't carry it because it corrodes iron. Then there are the economics. Producers depend on federal subsidies, and increasing demand for corn as fuel means the kernels keep getting pricier.

That's why researchers are prospecting for more alternatives, preferably ones that don't rely on food crops or a 51 cents-per-gallon tax break. Municipal waste, wood pulp and leftover grain and corn husks are all quite attractive; they can produce something called cellulosic ethanol, which contains more energy than corn. But they don't give up their bounty easily, so for now they're more expensive than corn-based ethanol to produce. Undeterred, researchers at several cellulosic-ethanol plants are developing innovative enzyme concoctions and heating methods to make the process more economic. Nothing like haste to make something out of waste.

2. Get Blueprints For a Green House

By Laura Locke

Reducing your impact on the earth is not just a question of what you drive but also of what you live in. Residential energy use accounts for 16% of greenhouse-gas emissions. If you begin thinking green at the blueprint stage, however, low-tech, pragmatic techniques will maximize your new home's efficiency. Installing those systems from the ground up is cheaper than retrofitting. "Doing simple things could drastically reduce your energy costs, by 40%," says Oru Bose, a sustainable-design architect in Santa Fe, N.M. For example, control heat, air and moisture leakage by sealing windows and doors. Insulate the garage, attic and basement with natural, nontoxic materials like reclaimed blue jeans. Protect windows from sunrays with large overhangs and double-pane glass. Emphasize natural cross ventilation. "You don't need to have 24th century solutions to solve 18th century problems," Bose says. Next, consider renewable energy sources like solar electric systems, compact wind turbines and geothermal

heat pumps to help power your home. When you're ready to get creative, GreenHomeGuide.com will help you find bamboo flooring, cork tiles, and countertops made from recycled wastepaper.

3. Change Your Lightbulbs

By Maryanne Murray Buechner

The hottest thing in household energy savings is the compact fluorescent lightbulb (CFL), a funny-looking swirl that fits into standard sockets. CFLs cost three to five times as much as conventional incandescent bulbs yet use one-quarter the electricity and last several years longer. They are available virtually everywhere lightbulbs are sold. Most labels don't say "CFL" (GE calls its bulbs Energy Savers), and in some cases the telltale twist is enclosed in frosted glass. The wattage gives them away: many 7-watt CFLs are comparable to a regular 40-watt bulb, 26 watts is the typical CFL equivalent of 100 watts and so on. Or just look for the Energy Star label.

CFLs have come a long way since they were first introduced in the mid-'90s (they don't flicker as much when you turn them on, for one thing), but because each bulb still contains 5 mg of mercury, you're not supposed to toss them out with the regular trash, where they could end up in a landfill. So the bulbs are one more thing for you to sort in the recycling bin.

Light-emitting diodes, or LEDs (see item 4), don't have this problem, but they can require a bit of DIY rewiring. LEDs work great as accents and task lights, and you can also buy LED desk and floor lamps. But if you're just looking to put a green bulb in your favorite table lamp, CFL is the way to go.

4. Light Up Your City

By Maryanne Murray Buechner

Cities can save energy—and money—by illuminating public spaces with LEDs, or light-emitting diodes. Last December Raleigh, N.C., turned one floor of a municipal parking garage into a testing ground for LEDs (see the before-and-after photos at cree.com/LEDcity). The new white, brighter fixtures use 40% less electricity than the high-pressure sodium bulbs they replaced. Although they cost two to three times as much, they can go five or more years without upkeep. Traditional bulbs must be replaced every 18 months. Other types of LEDs are already at work in traffic lights, outdoor displays (like those in New York City's Times Square) and stadiums; airports even use LEDs on their taxiways. If your city is still burning tax money on old lights, ask the mayor why.

5. Pay the Carbon Tax

By Bryan Walsh

Everyone agrees that it's necessary to reduce carbon emissions around the world. There is less agreement over exactly how nations should go about achieving a more carbon-free planet. Hence, the environmental equivalent of Elvis vs. the Beatles: cap-and-trade carbon emissions, or impose a carbon tax on all users? With cap-and-trade programs, governments limit the level

of carbon that can be emitted by an industry. Companies that hold their emissions below the cap can sell their remaining allowance on a carbon market, while companies that exceed their limit must purchase credits on that market. Carbon taxes are more straightforward: a set tax rate is placed on the consumption of carbon in any form—fossil-fuel electricity, gasoline—with the idea that raising the price will encourage industries and individuals to consume less. At the moment, cap-and-trade has the upper hand, since it serves as the backbone of the current Kyoto Protocol, and helped the U.S. reduce acid rain in the 1990s—but don't write off the tax just yet.

Supporters of the tax argue that a cap-and-trade system, especially one that would be global enough to mitigate the 8 billion tons of carbon the world now emits, would be too difficult to administer—and too easily gamed by industries looking to sidestep emissions caps. Cap-and-trade advocates counter that like all other flat taxes, a carbon levy would disproportionately burden lower-income families, who spend a greater percentage of their income on energy than rich households.

So which system will have the largest impact on carbon consumption? A 10% flat carbon tax might reduce the demand for carbon about 5% or less, according to an analysis by the Carbon Tax Center, an environmental advocacy group. That may not be enough. Businesses and governments haven't figured out how the two competing regimes can work together, but in the end, the world may need both.

6. Ditch the Mansion

By Bryan Walsh

Oversize houses aren't just architecturally offensive; they also generally require more energy to heat and cool than smaller ones, even with efficient appliances. And in the U.S., big houses are becoming the norm, even though a relatively inefficient small house consumes less energy than a greener large house and uses fewer building materials, which expand the carbon footprint. A typical new single-family home in the U.S. is nearly 2,500 square feet today, up from about 1,000 square feet in 1950, even as the average household has shrunk from 3.4 to 2.6 people.

If you really want to live small, visit Jay Shafer. The former art professor dwells alone in a home fit for a hobbit, 100 sq. ft. in northern California that he designed and built himself in 1999. Shafer now runs Tumbleweed Tiny House and sells custom designs for miniature dwellings that range from 70 sq. ft. to 350 sq. ft. He made his move because he felt guilty about the size of his residential carbon footprint, and now prefers life tiny and tidy. "If I throw my jeans down on the floor, I can't get across the room."

7. Hang Up a Clothes Line

By Bryan Walsh

You could make your own clothes with needle and thread using 100% organic cotton sheared from sheep you raised on a Whole Foods diet, but the environmental quality of your wardrobe is ultimately determined by the way you wash it. A recent study by Cambridge University's

Institute of Manufacturing found that 60% of the energy associated with a piece of clothing is spent in washing and drying it. Over its lifetime, a T shirt can send up to 9 lbs. of carbon dioxide into the air.

The solution is not to avoid doing laundry, tempting as that may be. Rather, wash your clothes in warm water instead of hot, and save up to launder a few big loads instead of many smaller ones. Use the most efficient machine you can find—newer ones can use as little as one-fourth the energy of older machines. When they're clean, dry your clothes the natural way, by hanging them on a line rather than loading them in a dryer. Altogether you can reduce the CO2 created by your laundry up to 90%. Plus, no more magically disappearing socks.

8. Give New Life to Your Old Fleece

By Kathleen Adams

Where do old fleece jackets go to die? Back to the mountain. Outdoor-gear label Patagonia is collecting used clothing (regardless of brand) made from Polartec and Capilene to melt and make into new fabric and clothes. (Some of that fleece is especially virtuous, starting out as fabric made from recycled plastic.) The company estimates that making polyester fiber out of recycled garments, compared with using new polyester, will result in a 76% energy savings and reduce greenhouse gases 71%. To shear your own fleece, visit patagonia.com/recycle.

9. Build a Skyscraper

By Michael D. Lemonick

Almost everything about the Bank of America tower, a soaring skyscraper under construction near Times Square in New York City, has been designed to minimize the use of energy. Take the concrete. Making the stuff from scratch is very energy intensive, so the builders are using a mix of 55% concrete and 45% slag, a waste product from blast furnaces. Mixing slag with concrete saves energy and makes the concrete stronger. The tower will save so-called gray water from washrooms and use it to flush the toilets. The building will also generate much of its own electricity from natural gas, a less potent carbon emitter than coal. These features will account for $3.5 million of a total building cost of $1.2 billion, but the owners expect to recoup that in a few years with all the energy they'll save. When it's finished next year, the tower will be the second highest in the city, but it stands alone as the greenest building in New York.

10. Turn Up the Geothermal Heat

By Kathleen Adams

With clever engineering and an elegantly simple design, Diane von Furstenberg reinvigorated women's fashion in the 1970s with the wrap dress. Can she do the same for a building? Her newest project is a 35,000-sq.-ft. office, showroom and retail store in Manhattan's trendy meatpacking district, all heated and cooled by water pumped from deep underground. This geothermal system taps into water that is a relatively stable 55°F and transfers that heat to warm the building in the winter and cool it in the summer. The building's roof is covered in easy-to-maintain plants and grasses, and has two heliostat mirrors, which track the sun and

direct its rays into the building, reducing the use of artificial lights during the day. Who says being environmentally conscious can't be cool—and hot?

11. Take Another Look at Vintage Clothes

By Coco Masters

High-end hand-me-downs (the smart set calls them vintage) are more ecologically sound than new clothes. Why? Buying a shirt the second time around means you avoid consuming all the energy used in producing and shipping a new one and, therefore, the carbon emissions associated with it. Every item of clothing you own has an impact on the environment. Some synthetic textiles are made with petroleum products. Cotton accounts for less than 3% of farmed land globally but consumes about a quarter of the pesticides. One quick way to change your duds: invite friends over for a closet swap, to which everyone brings a few items they want to trade. It's easy on the environment—and your pocketbook.

12. Capture the Carbon

By Peter Gumbel

Coal is one of the dirtiest fuels around and a major source of the world's carbon dioxide emissions. It's also hard to live without. In the U.S., half the electricity generated comes from coal. What if coal-fired plants stopped spewing their carbon dioxide fumes into the air and instead sequestered them—pumped them deep into the ground for storage?

Carbon sequestration is (despite its name) a simple-sounding idea that's exciting scientists, governments and energy companies as a way to cut emissions without disrupting energy supplies. One coal-fired plant in Denmark is working to trap carbon flue gases and store them in four spots, including an unused oil field off the coast of Spain. A Swedish utility is testing new ways to extract pure carbon dioxide from coal emissions in a lignite plant in eastern Germany. In the biggest test so far, a Norwegian energy firm is injecting 1 million tons of CO_2 a year from the Sleipner gas field into a saline aquifer under the North Sea. "All the basic technology is already here," says Howard Herzog, an energy expert at the Massachusetts Institute of Technology. A report by the International Energy Agency (IEA) in Paris says sequestration would be second only to energy-saving measures in reducing CO_2 emissions, far ahead of better-known efforts like renewable energy.

There are two major obstacles. The first is cost, which the IEA estimates to be as much as $50 for each ton of carbon captured. Those costs may drop if the technology is successful and utilities are given incentives not to spew out carbon dioxide. The other obstacle is a lack of detailed scientific knowledge. The pilot projects are going well, but M.I.T.'s Herzog says, "We'd like to see more large-scale demonstrations worldwide to really bolster confidence." In the meantime, watch for sequestration to move quickly up the energy agenda.

13. Let Employees Work Close to Home

By Coco Masters

Sitting in gridlock wastes your time and the planet's fuel. The only solution, it seems, is to move your home next to the office. But what if you could move the office a little closer to home? That, in essence, is the concept called proximate commuting. It works best for companies with multiple locations in one metro area. Gene Mullins, a software developer in Seattle, created a program that helps firms slash the time employees spend driving by matching them with work closer to home.

Mullins did studies for Starbucks, Key Bank, Boeing and, most recently, Seattle's fire department. He found that only 4% of the firefighters worked at the station closest to their home; some commuted 145 miles each way. At Boeing, daily commutes of its 80,000 Puget Sound employees total 85 circumnavigations of the earth. Using Mullins' program, some Key Bank branches reduced commutes of some workers 69%. Still, only about 20% of its employees work at the branch closest to their home, Mullins says. Yet escaping rush-hour traffic is its own reward. "For the same pay and the same job, who wouldn't want a shorter commute?

14. Ride the Bus

By Bryan Walsh

With transport accounting for more than 30% of U.S. carbon dioxide emissions, one of the best ways to reduce them is by riding something many of us haven't tried since the ninth grade: a bus. Public transit saves an estimated 1.4 billion gal. of gas annually, which translates into about 14 million tons of CO2, according to the American Public Transportation Association. Unfortunately, 88% of all trips in the U.S. are by car. Partly, that's because public transportation is more readily available in big urban areas. One promising alternative is bus rapid transit (BRT), which features extra-long carriers running in dedicated lanes. Buses emit more carbon than trains, but that can be minimized by using hybrid or compressed-natural-gas engines. A study last year by the Breakthrough Technologies Institute found that a BRT system in a medium-size U.S. city could cut emissions by as much as 654,000 tons over 20 years.

Thanks to high gas prices, miles driven per motorist dropped in 2005 for the first time since 1980, according to the Pew Research Center. The U.S. is ready to change. We're just waiting for the bus.

15. Move to a High-Rise

By Bryan Walsh

If you're a true environmentalist, a dyed-in-the-wool greenie, then why not pack up your leafy rural home and move to New York City—preferably to a tall building right in the middle of Manhattan?

The Big Apple is home to the greenest citizens in the U.S. Relatively few New Yorkers own cars—one of the biggest contributors to an individual's carbon emissions. Most walk, bike or ride public transit to work—all more efficient transport than the best hybrids.

And New York has developed up, rather than out, which limits wasteful sprawl. Eight million New Yorkers are squeezed into 301 sq. mi.—less than a fortieth of an acre per person. Even a fairly dense suburb devotes about a third of an acre to each person. Density means that commutes, shopping trips and supply chains are shorter. Plus, New Yorkers tend to live in small spaces, although they're a little cranky about it. The denser the area you call home, the smaller your personal carbon footprint—not to mention your gas and electricity bill.

16. Pay Your Bills Online

By Maryanne Murray Buechner

Eliminating your paper trail by banking and paying bills online does more than save trees. It also helps reduce fuel consumption by the trucks and planes that transport paper checks. If every U.S. home viewed and paid its bills online, the switch would cut solid waste by 1.6 billion tons a year and curb greenhouse-gas emissions by 2.1 million tons a year, according to Javelin Strategy & Research. Worried about security? Don't be. Just ignore e-mails "phishing" for personal data, and monitor all (electronic) statements for any unauthorized debits. Report problems immediately, and your credit won't take the hit. To avoid unnecessary carbon dioxide-emitting car trips to the bank on payday, ask your employer to directly deposit your paycheck. You'll get your money faster that way too.

17. Open a Window

By Carolyn Sayre

Most of the 25 tons of CO_2 emissions each American is responsible for each year come from the home. Here are some easy ways to get that number down in a hurry without rebuilding. Open a window instead of running the AC. Adjust the thermostat a couple of degrees higher in the summer and lower in the winter. Caulk and weatherstrip all your doors and windows. Insulate your walls and ceilings. Use the dishwasher only when it's full. Install low-flow showerheads. Wash your clothes in warm or cold water. Turn down the thermostat on the water heater. At the end of the year, don't be surprised if your house feels lighter. It just lost 4,000 lbs. of carbon dioxide.

18. Ask the Experts For An Energy Audit of Your Home

By Carolyn Sayre

How green is your abode? A home energy audit, which most utility providers will do free of charge, will tell you the amount of power your household consumes and what you can do to reduce it. The average family can find ways to shave 1,000 lbs. of CO_2 emissions each year. Energy auditors use special equipment like blower doors and infrared cameras to help you pinpoint exactly how your house is losing energy. You can also perform a do-it-yourself audit (see time.com/audit), but this is one time you might actually want to be audited by the experts.

19. Buy Green Power, At Home or Away

By Carolyn Sayre

More than 600 utilities in 37 states offer green energy, but unless you read the fine print on your bill, you may not know if your power company is one of them. (To find out, visit

eere.energy.gov/greenpower.) If you don't live in a green power zone, you can support the industry by buying renewable energy certificates, which allow you to purchase green energy in another part of the country. The extra dollars will dispense green power to the national power grid.

20. Check the Label

By Coco Masters

You wouldn't buy a car without knowing its gas mileage. Why not do the same when choosing energy-efficient ovens or even supermarkets and hotels? Energy Star, a rating system by the Environmental Protection Agency, will help you find them. Approved products can be pricier, but they cost less to power. Commercial buildings account for nearly 18% of U.S. greenhouse-gas emissions, but those with the Energy Star label consume 35% less energy than the average. By using Energy Star appliances at home, consumers can reduce their utility bill as much as 30%.

21. Cozy Up to Your Water Heater

By Carolyn Sayre

Improving your home's efficiency doesn't have to mean hours in the attic tearing out the insulation. It might be as simple as giving your dear old water heater a warm hug. Wrapping your heater in an insulated blanket—one costs about $10 to $20 at home centers—could save your household about 250 lbs. in CO_2 emissions annually. Most water heaters more than five years old are constantly losing heat and wasting energy because they lack internal insulation. If the surface feels warm to the touch, get your heater an extra blankie. You'll both feel better.

22. Skip the Steak

By Bryan Walsh

Which is responsible for more global warming: your BMW or your Big Mac? Believe it or not, it's the burger. The international meat industry generates roughly 18% of the world's greenhouse-gas emissions—even more than transportation—according to a report last year from the U.N.'s Food and Agriculture Organization.

Much of that comes from the nitrous oxide in manure and the methane that is, as the New York *Times* delicately put it, "the natural result of bovine digestion." Methane has a warming effect that is 23 times as great as that of carbon, while nitrous oxide is 296 times as great. There are 1.5 billion cattle and buffalo on the planet, along with 1.7 billion sheep and goats. Their populations are rising fast, especially in the developing world. Global meat production is expected to double between 2001 and 2050. Given the amount of energy consumed raising, shipping and selling livestock, a 16-oz.T-bone is like a Hummer on a plate.

If you switch to vegetarianism, you can shrink your carbon footprint by up to 1.5 tons of carbon dioxide a year, according to research by the University of Chicago. Trading a standard car for a hybrid cuts only about one ton—and isn't as tasty.

23. Copy California

By Laura Locke

Arnold Schwarzenegger may have signed the world's toughest anti-global-warming law, but it is Democrat Terry Tamminen, his environmental adviser, who is emerging as the state's real Terminator, winning industry support and the endorsement of a Republican Governor for a mandate to reduce the state's emissions 80% by 2050.

But thwarting climate change isn't a solo effort. Tamminen left his official post to build a national response to global warming one state at a time. "I am trying to Johnny Appleseed what California has done," Tamminen says. His goal is to create a de facto national climate plan out of individual efforts in the 50 states. "He is crisscrossing the country and spreading the word," says Karl Hausker, deputy director of the Center for Climate Strategies. "Terry gets state leaders interested in doing this." Hausker's nonpartisan, nonprofit group handles the technical details after Tamminen plants his seeds. Nineteen states have developed or are developing aggressive climate plans based on the work of Hausker's group and Tamminen. So much progress is being made at the state and regional level, Tamminen says, that "by the time that there is a new Administration in the White House, a majority of Americans will live in states with a meaningful plan that deals with the climate-change issue."

24. Just Say No to Plastic Bags

By Carolyn Sayre

The plastic bags you bring home from the supermarket probably end up in a landfill. Every year, more than 500 billion plastic bags are distributed, and less than 3% of those bags are recycled. They are typically made of polyethylene and can take up to 1,000 years to biodegrade in landfills that emit harmful greenhouse gases. Reducing your contribution to plastic-bag pollution is as simple as using a cloth bag (or one made of biodegradable plant-based materials) instead of wasting plastic ones. For your next trip to the grocery store, BYOB.

25. Support your local farmer

By Maryanne Murray Buechner

Fruit, vegetables, meat and milk produced closer to home rack up fewer "petroleum miles" than products trucked cross-country to your table. How do you find them? Search localharvest.org by ZIP code for farmers' markets, greengrocers and food co-ops in your area. The website, which includes handy contact information in its directory listings, also identifies restaurants that specialize in regional and seasonal ingredients. If you really want to get close to the farm, join a Community Supported Agriculture project, which lets you buy shares in a farmer's annual harvest. In return, you get a box of produce every week for a season. It will take more than a few visits to the farm stand to reduce the carbon impact of the U.S. food supply. In the meantime, here's another reason to go local: the taste is great.

26. Plant a bamboo fence

By Maryanne Murray Buechner

Bamboo makes a beautiful fence, and because it grows so quickly (as much as 1 ft. a day or more, depending on the species), it absorbs more CO_2 than, say, a rosebush. Most homeowners have to restrict its growth, lest it get out of control. Do this, however, and you reduce bamboo's capacity as a carbon sink. Only large-scale plantings, which absorb CO_2 faster than they release it, can favorably tip the scales. How big is your yard?

27. Straighten up and fly right

By Bryan Walsh

Until we can travel by fireplace, Harry Potter-style, the only way to get from Los Angeles to London is by carbon-spewing jet airliner. One simple change can help: adjust the exit and entry points each nation sets for its airspace so that planes can fly in as straight a line as possible. Last year the International Air Transport Association negotiated a more direct route from China to Europe that shaved an average 30 minutes off flight time, eliminating 84,800 metric tons of CO_2 annually. Unifying European airspace as a "single sky" could cut fuel use up to 12%. Pilots could also change the way they fly. Abrupt drops in altitude waste fuel, so experts are advocating "continuous descent" until the plane reaches the runway—where it could be towed instead of burning fuel while taxiing. Of course, the best way to reduce plane emissions is to fly less. At least until the fireplace is ready for takeoff.

28. Have a green wedding

By Catherine Sharick

You won't be able to stop global warming on your wedding day, but your choices can lessen the carbon footprint of your event. For example, if your guests are traveling long distances, offset the carbon emissions from their trips with a donation to renewable—energy projects. The sustainable—wedding website Portovert.com, in partnership with NativeEnergy, a renewable energy company, offers a wedding carbon calculator where couples can enter the number of guests and approximate miles traveled, to calculate the carbon impact of their wedding—related travel.

Wherever you celebrate, you can reduce your CO_2 impact and often save money by giving your wedding a local touch. Buy wine from a nearby vineyard or beer from a neighborhood brewery. Get your wedding cake from a local bakery, and use seasonal flowers, not imports. "Why eat food or drink wine or beer that has traveled thousands of miles when you can choose local options that are just as good?" says Meghan Meyers, CEO of portovert.com.

Anything you do to make your wedding a little more modest—from wearing a borrowed wedding dress to choosing recycled paper or a website for your invitations—will lower its contribution to carbon emissions. Consider it your wedding gift to the planet.

29. Remove the tie

By Bryan Walsh

How can a tie help fight climate change? When you leave it at home. In the "cool biz" summer of 2005, Japanese salarymen swapped their trademark dark blue business suits for open collars and light tropical colors. It was all part of the Japanese government's effort to save energy by keeping its office temperatures at 82.4 F throughout the summer.

The policy caused sartorial confusion but did make a dent in Japan's rising carbon emissions. In one summer, Japan cut an estimated 79,000 tons of CO2. If U.S. businesses eased off on their arctic-level air-conditioning, the gains could be significant. Time to make every summer day casual Friday?

30. Shut off your computer

By Coco Masters

A screen saver is not an energy saver. According to the U.S. Department of Energy, 75% of all the electricity consumed in the home is standby power used to keep electronics running when those TVs, DVRs, computers, monitors and stereos are "off." The average desktop computer, not including the monitor, consumes from 60 to 250 watts a day. Compared with a machine left on 24/7, a computer that is in use four hours a day and turned off the rest of the time would save you about $70 a year. The carbon impact would be even greater. Shutting it off would reduce the machine's CO2 emissions 83%, to just 63 kg a year.

31. Wear green eye shadow

By Caroline Sayre

Bright green may not be in this season, but eco-friendly makeup has trend written all over it. In February, Cargo Cosmetics launched PlantLove, a botanical lipstick packaged in a 100% biodegradable tube made of polylactic acid—a corn-based renewable resource. When the tube is empty, plant it in the ground, and it sprouts flowers. The product represents only a sliver of the $50 billion industry in the U.S., but it's growing fast. The market for organic personal-care products will increase more than 8% this year.

32. Kill the Lights At Quitting Time

By Coco Masters

Assigning an office switch-off monitor might sound a little like third grade, but it could cut carbon emissions by reducing electricity use, not to mention extending equipment life and lowering maintenance costs. It's not exactly glamorous work: walking the halls to make sure that computers, monitors, desk lights, printers and fax machines are turned off daily. Air conditioners and overhead lights can be timed for turnoff: Aim for off-peak energy use to be about one-fifth of peak use. In the morning, the switch-on monitor takes over.

33. Rearrange the Heavens and the Earth

By Bryan Walsh

What if we could build a giant mirror in space to deflect the sun's energy? Or inject sulfur into the stratosphere to cool the earth? Scientists are examining such sci-fi methods as a gigantic

Plan B should efforts to end carbon emissions fail. Geoengineering, as the field is called, involves rearranging the environment on a planetary scale. The best-known idea involves the so-called space mirrors. Roger Angel, an astronomer at the University of Arizona, suggests putting trillions of small, ultra-thin lenses into orbit, enough to form a cylindrical cloud with a diameter half the size of the Earth's equator and a length of 60,000 miles. Placed 1.5 million km above the Earth's surface, the massive mirror would reduce the amount of sunlight reaching the planet by about 2%, which Angel believes would be enough to offset a significant amount of warming. Implementing this plan would be no mean feat: the mirrors would collectively weigh 20 million tons and cost trillions of dollars. And to get all those lenses into orbit, we'd have to launch rockets every five minutes for 10 years.

Writing in the journal *Climate Change* last August, Nobel Prize-winning meteorologist Paul Crutzen theorized that by pumping a huge amount of sulfur dioxide into the stratosphere, we could create a layer of sulfates that would reflect sunlight. Since the Earth itself reflects about 30% of sunlight back into orbit, increasing the reflectivity of the planet just slightly could be enough to counter warming. There's historical evidence that this would work—when Mount Pinatubo in the Philippines erupted in 1991, spewing sulfur into the atmosphere, temperatures around the world dropped for two years. Of course there's a catch: sulfur dioxide is a main cause of acid rain and a respiratory irritant. We'd have a cooler but dirtier Earth.

Such strategies may sound implausible, but the president of the prestigious National Academy of Sciences recommended exploring geoengineering options last year. That these far-out ideas are getting a serious hearing in mainstream science is a measure of how desperate the battle against climate change is becoming.

34. Rake in the Fall Colors

By Coco Masters

Few things rip through the serenity of a Sunday in suburbia like the 70-db wail of a gas-powered leaf blower. Improvements have been made to make them more efficient, but using that motorized hurricane for just an hour still sucks down 1 pt. of gas and oil. With more than 30 million acres of lawn in the U.S., it's a high price to pay for a job that can be done almost as well, if somewhat more slowly, with a rake. Besides, you can't lean on a leaf blower when you're done.

35. End the Paper Chase

By Coco Masters

Americans recycled 42 million tons of paper last year—50% of what they used—but still pulverized the rest. Paper does grow on trees: 900 million of them every year become pulp and paper.

We can reduce that number by buying more recycled paper. It uses 60% less energy than virgin paper. Each ton purchased saves 4,000 kW-h of energy, 7,000 gal. of water and 17 trees, and a tree has the capacity to filter up to 60 lbs. of pollutants from the air.

36. Play the Market

By Michael D. Lemonick

To cut back on carbon, environmentalists are using the force of the free market. In carbon-emissions trading, the government puts a cap on how much carbon an industry is allowed to emit from power plants, factories and cars. Innovative companies could meet those caps through actual reductions and earn carbon "credits," which they could sell to industry laggards. Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York and Vermont have agreed on a regional cap-and-trade system. Arizona, California, New Mexico, Oregon and Washington have signed a similar pact. New emissions-reduction technology is sexier, but old-fashioned horse trading might just be more effective.

37. Think Outside the Packaging

By Bryan Walsh

Paper or plastic? How about neither? All those Styrofoam peanuts and impregnable plastic CD cases cost energy to manufacture and deliver, and that means carbon. You can reduce the amount of packaging with a little consumer vigilance. Give back the extra napkins or unwanted sugar packets; carry that gallon of milk by its handle. True eco-nerds will even bring their own cup to a Starbucks.

Corporations are also beginning to pitch in. Hewlett-Packard announced in February that it would switch to lighter packaging for its printer cartridges, which will reduce carbon emissions by an amount equivalent to removing 3,500 cars from the road for a year. Megaretailer Wal-Mart, far out front in this effort, has trimmed everything from its rotisserie-chicken boxes to its water bottles, each now made with 5 g less plastic. The company plans to cut packaging 5% starting in 2008—enough to prevent 667,000 tons of carbon dioxide emissions.

38. Trade Carbon for Capital

By Simon Robinson

One of the most ambitious of the Kyoto Protocol's plans to help cut greenhouse gases was the Clean Development Mechanism, through which companies in the rich world could earn credit not for reducing their own emissions but for investing in energy efficient projects in the developing world. The idea, which was included in the Kyoto Protocol at the insistence of the U.S., has helped create a global trade in carbon credits, in addition to the broader emissions-trading market. So far, hundreds of projects have been approved, some two-thirds of them in just three countries: Brazil, China and India. Together, the projects save the equivalent of about 115 million tons of carbon dioxide per year, and range from installing more energy efficient machinery in paper and cardboard factories to building wind turbines to generate renewable power.

There have been some hiccups. A recent study found that factories in China were using relatively cheap cleaning systems and then exploiting a loophole to claim hundreds of millions of dollars in carbon credits. But that is no reason to abandon the CDM mechanism argues Rajesh K. Sethi, secretary of India's CDM Authority in the Ministry of Evironment and Forests.

Sethi says the CDM is "one of the most succesful ways we've found to reduce greenhouse gases. It needs to be extended, not abandoned." The trade in carbon credits would explode if the regulations were made more predictable, so that poor world companies didn't have to wait so long for the go-ahead for projects. Says Sethi: "We're very much encouraged by how well this has done, but we can do a lot better."

39. Make Your Garden Grow

By Coco Masters

The U.S. spends more than $5 billion a year on fossil-fuel-derived fertilizers that leak chemicals into the ground and accelerate the release of nitrous oxide—a greenhouse gas. Try alternatives, from old-fashioned compost to grass clippings, which contain about 4% nitrogen. More adventurous gardeners use a homemade fertilizer mix that includes seaweed extracts for potassium and fish proteins and oils for nitrogen. Or go native and embrace wildflowers and indigenous grasses. Weeds are a matter of taste.

40. Get a Carbon Budget

By Bryan Walsh

The essential injustice of global warming is that the poor will suffer the worst effects while contributing far less to carbon emissions than the rich. So here's a radical solution: divide greenhouse-gas emissions by population, and give everyone in the world the right to emit the same amount of carbon—a personal carbon allowance.

Essentially, allowances are a cap-and-trade scheme for individuals. They set a clear target and let the market work out the details. Bike to work and live beneath your allowance, and you can sell your carbon credits to energy spendthrifts who refuse to give up their SUVs. The balance of your allowance might be recorded on a sort of carbon-debit card, so if you buy that SUV, you'll be spending carbon too. If you want to keep living as if it's 1989, all you have to do is pay for it.

41. Fill'er Up With Passengers

By Coco Masters

The next time you get behind the wheel of your car, turn to the passenger seat. Chances are, it's empty. In most of the U.S., the single-occupant driver still reigns supreme. Nearly 80% of people drive to work alone; about 38% drive alone in general. In some places, that's starting to change. As part of its Clean Air Act, Washington State appealed to business with incentives to encourage employees to drive less or at least stop driving alone. A state tax credit benefits companies that encourage their employees to carpool, ride the bus, walk or bike to work, or work a compressed workweek. The result: about 20,000 fewer vehicle trips each morning since the program started in 1991, saving commuters $13.7 million and 5.8 million gallons of gas, and reducing 78,000 tons of air pollutants and CO2-equivalent gases.

42. Pay For Your Carbon Sins

By Unmesh Kher

Feeling full of climate-change guilt, Americans are snapping up carbon offsets from Web-based retailers and nonprofits. Unlike mandatory allowances, offsets allow consumers to pay voluntarily to reduce carbon emissions by a quantity equal to their estimated contribution. The money typically funds clean-energy projects, pollution control, tree planting and forest conservation. But offsets are picking up skeptics along with customers. Critics say consumers have little assurance that the projects they underwrite really reduce emissions and warn that those buying offsets may sometimes pay for improvements that would have happened anyway. They also argue that carbon-offset trading distracts from the urgent need to change U.S. policies to address global warming.

Are these criticisms fair? "There needs to be more standardization, more verification and more assurances for the consumer that the offsets are real," concedes Ricardo Bayon, director of Ecosystem Marketplace. A number of organizations, including the Center for Resource Solutions in San Francisco and the Climate Group, based in Britain, are racing to establish certification standards. Even supporters of offset trading agree that it's no substitute for comprehensive national policies. "This voluntary stuff is an interim measure," says Judi Greenwald of the Pew Center on Global Climate Change. "But it is certainly better than doing nothing."

43. Move to London's New Green Zone

By Adam Smith

Homes in London account for 44% of the city's CO_2 emissions, more than twice the amount spewed out through transport. Worse still, the city needs to add 35,000 more every year to keep up with London's ballooning population.

That's why, on a brownfield site in the city's docklands, builders plan in 2010 to open the city's first large-scale zero-carbon housing development. All 233 homes on the 3-acre spot will hook up to a combined heat-and-power plant that turns wood chips into electricity and hot water, with extra juice from solar panels and wind. And should a chilly winter call for extra energy from the national grid, the plant will return an equivalent amount once demand from residents has dropped off. Renewable energy isn't the only advantage. Home owners can expect greenhouses for organic food, plus car and bicycle clubs to reduce commuters' emissions.

A response to the challenge from London's mayor to show that zero-carbon homes can be commercially viable, the development could cost just 5% more than standard projects. At least a third of the homes will be reserved for affordable housing. Helping the planet need not cost the earth.

44. Check Your Tires

By David Bjerklie

So you own a plain-vanilla, nonhybrid, American-made gas guzzler and can't afford (or can't wait for) a hybrid. Now what? Just giving your engine a tune-up can improve gas mileage 4%

and often much more. Replacing a clogged air filter can boost efficiency 10%. And keeping tires properly inflated can improve gas mileage more than 3%. The bottom line? If you can boost your gas mileage from 20 to 24 m.p.g., your old heap will put 200 fewer pounds of CO2 into the atmosphere each year.

45. Make One Right Turn After Another

By Caroline Sayre

United Parcel Service took a detour to the right on its way to curb CO2 emissions. In 2004, UPS announced that its drivers would avoid making left turns. The time spent idling while waiting to turn against oncoming traffic burns fuel and costs millions each year. A software program maps a customized route for every driver to minimize lefts.

In metro New York, UPS has reduced CO2 emissions by 1,000 metric tons since January. Today 83% of UPS facilities are heading in the right direction; within two years, the policy will be adopted nationwide.

46. Plant a Tree in the Tropics

By Bryan Walsh

It seems like simple arithmetic: a tree can absorb up to a ton of carbon dioxide over its lifetime, so planting one should be an easy way to mitigate climate change. Turns out it's not so simple. Recent studies have shown that trees in temperate latitudes—including most of the U.S.—actually have a net warming effect on the climate. The heat that dark leaves absorb outweighs the carbon they soak up.

47. If You Must Burn Coal, Do it Right

By Bryan Walsh

The poor coal plant: not only does it emit environment-damaging compounds, but even the newest (which can cost as much as $3 billion to build) lose more than half the heat generated when the coal is burned. But in co-generation power plants, that excess heat is captured and reused for domestic and industrial heating, nearly doubling a plant's efficiency. The process is similar to what goes on in your car—think of the engine as a mini cogeneration plant. When the engine runs, it create excess heat while driving the car, and in cold weather, that waste product is used to warm the car.

Cogeneration is a favorite environmental initiative of fossil fuel companies. ExxonMobil owns parts of 85 cogeneration plants in 30 locations; the company estimates that the technology helps it avoid 9 million tons of CO2 a year. In fossil-fueled China, cogeneration is seen as a cutting-edge technology, and enables the country to prevent nearly 100 million tons of CO2 annually.

It's not the ideal solution, but thermal power will remain the backbone of our electricity grid for the foreseeable future. If we're going to burn coal and oil, we might as well make sure all that carbon doesn't go to waste.

This is an extended version of the article that originally appeared in TIME Magazine.

48. Drive Green on the Scenic Route

By Caroline Sayre

Going on vacation doesn't have to mean leaving your green conscience at home. The car-sharing service Zipcar rents hybrids cars in five U.S. cities, Toronto and London. A few specialty companies offer rental cars that run on biodiesel fuel, a clean-burning substance derived from renewable sources like vegetable oil. Bio-Beetle rents eco-friendly cars, ranging from Passats to Jeeps, in Hawaii and Los Angeles. A week's rental in L.A. runs from $200 to $300. And competitor EV Rental Cars has started to expand beyond the West Coast.

49. Set a Higher Standard

By Bryan Walsh

If cars have to meet energy standards, why don't power plants? Carbon-emission standards limiting the amount of CO_2 that a new power plant can spew are in place in a handful of states. California's tough new rules virtually exclude new coal plants until clean-coal technology comes on line, and could establish a national standard—just as they might for auto emissions. A federal carbon standard would be aggressively opposed by power companies that depend on coal. But it could also spur investment in renewables, clean coal and even nuclear (that's another fight) more rapidly than carbon taxes or cap-and-trade systems. With 159 new coal-powered plants slated for the next decade, a critical choice is looming.

50. Be aggressive about passive

By Stephanie Kirchner

Georg Zielke, his wife and kids share a five-bedroom "passive house" in Darmstadt, Germany, with heating costs 90% lower than their neighbors'. Extra insulation and state-of-the-art ventilation recycle the energy from passive sources such as body heat, the sun and household appliances to warm the air. When it gets really cold, the Zielkes just turn on the TV.

The German government has thrown its weight behind the idea, guaranteeing low cost loans for people who want to build a passive house. They cost about 5% to 8% more to build than a standard one. Invented in a German-Swedish joint-venture in he early 1990s, about 10,000 have been built in Europe so far, most of them in Germany—and just three in the U.S.

This is an extended version of the article that originally appeared in TIME Magazine.

51. Consume Less, Share More, Live Simply

By Coco Masters

The chance to buy a carbon offset—in essence, an emissions indulgence—appeals to the environmental sinner in all of us. But there is an older path to reducing our impact on the planet that will feel familar to Evangelical Christians and Buddhists alike. Live simply. Meditate. Consume less. Think more. Get to know your neighbors. Borrow when you need to and lend when asked. E.F. Schumacher praised that philosophy this way in Small Is Beautiful: "Amazingly small means leading to extraordinarily satisfying results."