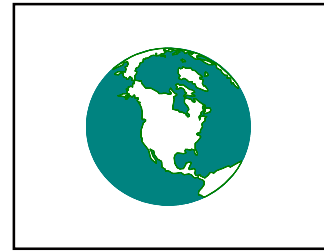


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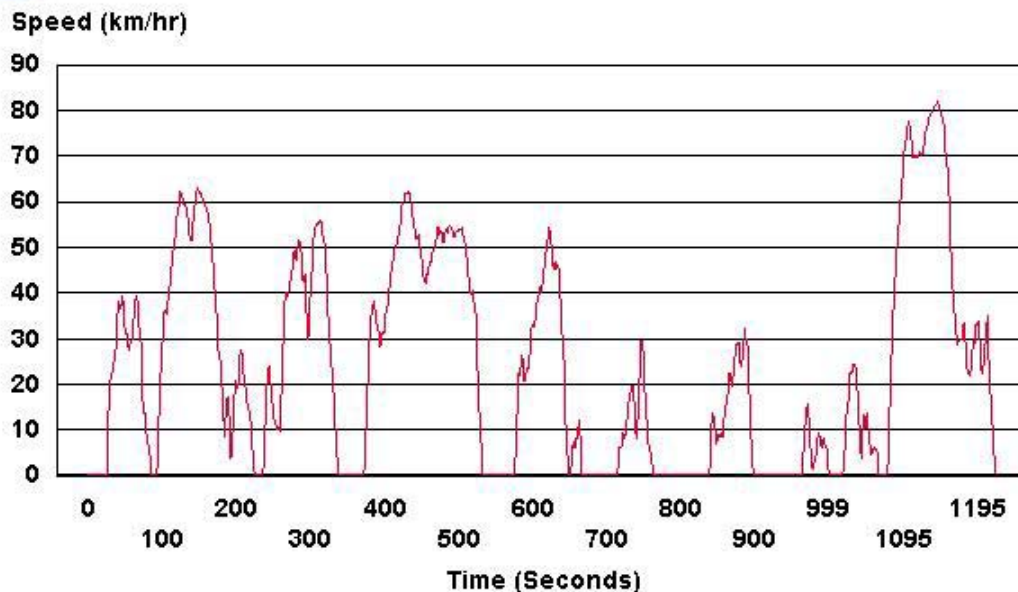


CAR LINES

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EUROPE

1. Scotland Is Latest To Get Sulfur Free Fuel

During February, BP said it was selling petrol and diesel almost completely free of sulphur for the first time at a few British service stations. The company said the fuels are the cleanest in Britain - with a maximum sulphur content of 10 parts per million - and come six years before mandatory European Union targets.

The cleaner fuels are now available at 18 BP service stations in the Edinburgh area of Scotland.

The sulphur-free fuels, as they are known, are a step beyond ultra low sulphur diesel and ultra low sulphur petrol fuels - with less than 50 ppm sulphur - introduced in the UK in 1999 and 2000. The new cleaner motor fuels are already marketed in Sweden and Germany. Sulphur-free diesel is just about to go on sale in California.

Immediate environmental benefits include the reduction of sulphur dioxide emissions that contribute to acid rain, and a reduction in particulate emissions that can lead to respiratory diseases, BP said in a statement.

The European Union is in the late stages of a debate that could require that sulphur-free fuels be made readily available from 2005 and available at all sites in 2008 or 2009.

2. London Drivers Could Pay Congestion Tax

The streets of central London could soon be a little clearer under plans recently announced by the Mayor to charge motorists a congestion tax. Motoring organizations said the new tax should wait until London's overcrowded public transport system could cope with the extra demand the congestion charge scheme would encourage.

But London Mayor Ken Livingstone said a daily charge of five pounds (\$7) would be levied on motorists driving into the heart of the capital between 7 a.m. and 6.30 p.m. starting early next year. The scheme will use hundreds of cameras to check vehicle license plates to ensure they have paid, and to enforce fines of 40 pounds or more.

Officials said 40,000 vehicles an hour drive into the taxable zone and the charge should cut this by 15 percent.

Emergency vehicles, motorcycles, buses and taxis will be exempt from London's scheme. Others, such as those living in the zone and the disabled, will qualify for a discount.

Traffic in central London limps along at 9.9 mph (15 kph), the lowest average speed since before cars were invented.

The central London scheme could lead to a wider plan affecting the whole country.

The government-sponsored Commission for Integrated Transport announced proposals to make peak-time drivers pay for the privilege while persuading other motorists to move their journeys to times and routes attracting a lower tariff.

Vehicles would be fitted with a transponder and their movements monitored by satellite.

3. Europe Moving Ahead With Kyoto Ratification

A. Dutch Set Pace

The Netherlands set the pace in the European Union for ratification of the global pact to cut emissions of harmful greenhouse gases after its legislators backed the 1997 Kyoto treaty. The environmentally conscious Netherlands is on track to become one of the first major industrialized countries to approve the treaty after its lower house of parliament unanimously supported the agreement, the Dutch government said.

The treaty, which must get a final stamp of approval from the Dutch parliament's upper house next month, commits the Netherlands to slashing its carbon dioxide output by six percent from 1990 levels by 2012.

The overall target for industrial states' is a 5.2 percent cut.

Members of the European Union have said they hope the measure will be passed by all member states by June.

So far only two states with targets, the Czech Republic and Romania, have ratified the treaty.

B. EU States Agree

The 15 European Union member states agreed to be legally bound by the Kyoto treaty on cutting the pollution blamed for global warming, which the United States has rejected.

"The Kyoto Protocol to the United Nations Framework on Climate Change...is hereby approved on behalf of the European Community," said a formal text agreed by EU environment ministers meeting in Brussels.

The legal move, which means EU member states may face court action if they fail to reach their emissions targets, confirmed the bloc's chosen position as defender of the global warming treaty, said EU Environment Commissioner Margot Wallstrom.

"It allows us to maintain our credibility and strengthen our leadership role on climate change," Wallstrom told a news conference after the meeting.

The 1997 United Nations treaty commits the EU to reduce its emissions of "greenhouse gases" by eight percent of 1990 levels during the five-year period 2008-2012.

Since the U.S. pullout, the EU has led a diplomatic offensive to ensure countries such as Russia, Japan and Canada stick with Kyoto, and said it would ratify before a global summit

on sustainable development to be held in Johannesburg in August and September. Kyoto cannot come into force until it is ratified by at least 55 countries representing 55 percent of developed countries' carbon dioxide emissions.

As the United States produces one third of those emissions, almost all other developed countries must ratify Kyoto if it is to come into legal force. The EU produces 24.3 percent. At U.N. climate talks in Marrakesh, Morocco, in November, Russia, Japan and Canada said they would ratify but have yet to do so. The EU will urge them to do so before Johannesburg, Wallstrom said.

Formal EU ratification will happen when the bloc and all 15 members present their paperwork to the U.N. secretariat, expected by June.

C. UK Calls For The US To Rejoin The Kyoto Climate Treaty

Britain has once again called for the United States to commit to the Kyoto treaty.

"We continue to believe that (the Protocol) presents the only workable option for the international community to take serious action and we urge other countries to ratify as soon as possible, including the U.S. who we would like back on board in the future," said Britain's Environment Secretary Margaret Beckett in a statement to parliament.

Beckett made the call to the U.S. as she laid the plan to ratify the treaty - which will legally bind the country to

meeting targets on reducing greenhouse gas emissions - before the House of Commons.

"Ratification will mean that the UK is legally bound by its Kyoto target to reduce greenhouse gas emissions by 12.5 percent below 1990 levels in 2008-2012," she said.

Britain has already set itself a target to cut emissions by 23 percent on 1990 levels by 2010.

4. New EU Motorcycles To Be As Clean As New Cars From 2006

The EU Parliament and Council have agreed on a set of tough new rules designed to reduce pollution from motorcycle exhaust fumes by establishing mandatory pollution limits that will apply from 2006 and will make new motorcycles as clean as new cars have been since 2000.

Parliament's negotiators have achieved their central goal of setting binding pollution limits from 2006, to follow the first set of compulsory limits to be introduced in 2003. They also held out for realistic methods for testing emissions. As part of the package deal endorsed unanimously by the Parliament and Council delegations, two test cycles for measuring emissions will be used in parallel, during a transition period, as a basis for the new, 2006 limit values.

These will be the test cycle (designed for cars) currently used for measuring emissions and a new one, designed for motorcycles and based on the UN-ECE world-wide test cycle on which work has almost been completed. Once this new

worldwide test cycle has been widely recognized, the old one will be phased out.

Rapporteur Bernd Lange welcomed the deal on the new directive as 'a good compromise, which will improve air quality in Europe'. At present, although two and three-wheeled vehicles only make up 2 or 3 per cent of total traffic volume in Europe they produce 15 per cent of transport hydrocarbon emissions.

The two sides also agreed on measures to prevent tampering with emission control devices, durability criteria and standards for tricycles and quadricycles. The new directive now has to be approved by the full Parliament and Council at third reading. Parliament's third reading is scheduled for the Brussels part-session in May.

5. The UNECE Adopt EU Heavy Truck Rules

In the context of the World Forum for Harmonization of Vehicle Regulations (WP.29), a large number of UNECE member countries have decided not to approve any more new lorries, buses or coaches of more than 3.5 tons if they do not comply with a new set of stricter exhaust emission standards. The new standards, identical to the EU EURO 3 standards, establish limits for the exhaust emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx) and particulates (PT), which represent a 30% reduction compared with the previous limits.

The UNECE has also established

that, as from 1 October 2005, those emission limits will be replaced by another set of still lower emission standards, equivalent to the EU EURO 4 standards, which will represent a further 30% reduction in the emission limits of CO, HC and NOx and a further 80% reduction for PT. A further 43% reduction in the emission limits of NOx has already been adopted for mandatory implementation as from 1 October 2008.

These regulatory improvements have been made possible by the cooperative work of Governments, the European Commission and international organizations representing the car manufacturing industry, road users and consumers, acting together in the framework of WP.29.

WP.29, which works under the auspices of the UNECE Inland Transport Committee, develops UNECE vehicle regulations, which may concern not only emissions but also the various safety aspects of the many types of road vehicles. They are developed so far in the legal framework of an Agreement known as the 1958 Agreement. About 115 such Regulations are annexed to this Agreement. In future, global regulations will be developed in the framework of a new global Agreement already in force.

6. U.K. Personal Tax on Company Cars To be Based on Carbon Dioxide Emissions

The personal tax liability assessment for people who use their cars for work in the United Kingdom will be

based on the carbon dioxide emission of that vehicle beginning April 6. Many high business mileage employees are expected to face higher personal tax charges as a result of the change for so-called company cars.

Inland Revenue estimated that the new regime would lead to bigger tax bills for one in four of the country's 2.6 million company car drivers. But it also will help the United Kingdom meet its commitments under the Kyoto Protocol to reduce greenhouse gas emissions.

Inland Revenue is the U.K. government unit responsible for administration of the income tax, tax credits, the corporate tax, the capital gains tax, the petroleum revenue tax, the inheritance tax, national insurance contributions, and stamp duties.

British Chancellor of the Exchequer Gordon Brown included the change three years ago in his finance bill as a way to encourage use of more environmentally friendly, fuel-efficient cars. He estimated the added cost to be about £1 (\$1.44) a week for a typical company car user.

Under the old system, the company car tax was based on the number of miles driven each year. The tax was collected by amending an employee's tax code. The employee was treated as having earned an extra income, and the vehicle tax was collected through the payroll deduction system.

The charge was 35 percent of the list price of the car if business use of the vehicle was less than 2,500 miles per year. The percentage was reduced to 25 percent where business mileage was between 2,500 miles and 18,000 miles per year or to 15 percent when business mileage was in excess of 18,000 miles per year.

The old tax regime is being replaced by one based on carbon dioxide emissions, expressed as grams per kilometer. The new one has 21 tax brackets for carbon dioxide emissions. The basic car, emitting less than 169 g/km of carbon dioxide, qualifies for the 15 percent tax bracket, while the biggest gas-guzzler will be taxed at the highest bracket of 35 percent.

Inland Revenue said it would rely upon data provided by the Society of Motor Manufacturers and Traders to determine carbon dioxide emissions.

The U.K.'s internal revenue service said, however, that carbon dioxide emissions vary with engine size, so as a rule, a small, low-emissions car will lead to a lower tax bill.

Diesel-fueled cars are unlikely to offer any tax advantage. Despite the fact that they release lower amounts of carbon dioxide than their gasoline equivalents, they are believed to have greater impact on local air quality, so they will carry a 3 percent surcharge on the tax brackets under the new regime.

7. UK Says Carbon Emissions Rise After Years Of Falls

Britain's drive to cut the emission of greenhouse gases took a knock recently when the government announced that carbon pollution was rising despite a raft of recent schemes and incentives. Government figures now show there was a slight increase in 2000 and 2001 of carbon emissions after a fall of six percent since 1990.

"For anyone who might have grown complacent, these figures demand that we must do more to address our environmental obligations," Energy Minister Brian Wilson said in a statement.

Britain's target under the Kyoto Protocol is to reduce greenhouse gas emissions by 12.5 percent on 1990 levels by 2010. The country has also set a domestic goal to reduce emissions by 20 percent on 1990 levels.

The government attributed the rise in carbon emissions to an increased use of coal in electricity generation and colder weather in the winter months.

Wilson said he hoped the government's commitment to generate 10 percent of the nation's power from renewable energy within the decade, from less than three percent currently, and the start of emissions trading in April would reverse the current upward trend in carbon emissions.

Coal burning has become more popular in Britain in the last couple of

years as generators switch to the more polluting fuel rather than the cleaner but more expensive natural gas in the increasingly competitive wholesale electricity market.

A report earlier this year by economic forecaster Cambridge Econometrics said Britain was likely to miss its targets for reducing its carbon dioxide emissions because the target had been set partly on the assumption generators would continue to embrace cleaner-burning gas-fired power stations. But the "dash for gas" - the defining characteristic of the last decade, which saw gas use shoot up - has stalled in the face of soaring wholesale gas prices.

Government figures show that in the first quarter of 2001 coal consumption rose 17.4 percent against 3.6 percent for gas.

8. EU Says Kyoto Still Worthwhile Without US

The Kyoto protocol will fall far short of its goals to cut greenhouse gases because of the pullout by the United States and possible foot dragging by Canada, but it is still a pact worth fighting for, a senior European Union official said. "It is less effective. Of course it makes it a weaker protocol if the biggest emitter stays outside," Margot Wallstrom, the EU's environment commissioner, said after the first day of the Group of Eight environment ministers meeting being held in the heart of the Canadian Rockies.

"At the same time, I think that we will have to live with this issue of climate

change for so long that the overall objective of getting an international framework, a start of international cooperation, on this issue is more important," Wallstrom said in an interview.

She predicted the United States could eventually be brought back into the signatories of the 1997 accord. The 15 EU member states agreed in March to be legally bound by it.

She said there was much tension between the EU and the United States over the issue. "But at the same time we are trying to identify areas where we can cooperate, where we can find constructive dialogue, and that includes working on science, completing the knowledge gaps that still exist."

To the outrage of environmental activists, the climate change issue is not on the official agenda of this weekend's G8 environment meeting in the resort town of Banff. The meeting is mostly concentrating on sustainable development issues. But climate change looms large in the background and there is also criticism for Canada, this year's G8 host, which has yet to ratify the Kyoto protocol.

Wallstrom was adamant Canada should not be given credits for cleaner energy it exports to the United States in its efforts to meet emission targets, a position Canadian Environment Minister David Anderson has advocated.

The G8 includes the United States,

Britain, Canada, France, Italy, Germany, Japan and Russia.

9. EU Motorways Grow 25% in 10 Years While Rail Shrinks

The motorway network in the European Union grew by one quarter over the last decade while the railways shrank, EU statistics agency Eurostat has announced. In 1999 the 15-country bloc had almost 50,000 kilometers of motorway, with the biggest increases in Spain and France. The rail network shrank by four percent to around 154,000 kilometers.

The figures demonstrate the enormity of the challenge facing the EU, which is trying to boost the railway's share of passenger and goods transport to reduce congestion and pollution on the roads. The European Commission predicts truck traffic alone will rise by 50 percent over the next 10 years if it is not curbed by regulation.

The Eurostat report on transport infrastructure also revealed big differences between the EU and its neighbors to the east, which are applicants to join the bloc. For example, the EU has six times as much motorway per square kilometer than Eastern Europe and a quarter less railway line, it showed.

In aviation, the report found Eastern Europe's busiest 10 airports only handled about six percent of the passenger numbers that pass through the EU's top hubs. The busiest eastern airport, Prague, saw 4.8 million international passengers in 1999, while London Heathrow, the

EU's biggest, handled 54.8 million.

NORTH AMERICA

10. Senate Rejects Hike In Vehicle Fuel Efficiency Standards

The U.S. Senate rejected a proposal for a 50 percent boost in fuel efficiency for cars and sport utility vehicles, giving a victory to the heavy lobbying of the auto industry and a defeat to environmentalists. Instead, lawmakers gave the federal government two years to develop its own targets. They also agreed to exempt pickup trucks - which account for 19 percent of automakers' sales - from any future increases in vehicle fuel requirements.

However, it remained uncertain whether the Senate's fuel economy provision would become law because it is part of an underlying energy bill that still faces a tough fight.

Automakers argued that stricter standards would cost thousands of labor union workers their jobs and force "soccer moms" to switch to smaller, less safe vehicles.

The decision was a blow to environmental groups and some moderates from both parties, who said the United States needs more fuel-efficient vehicles to reduce dependence on foreign oil.

The debate was the most acrimonious battle yet over the Senate's attempt to write a broad energy policy that promotes more domestic energy production and

conservation. Instead of boosting fuel standards, the Senate approved a weaker provision requiring the federal government to first consider the impact of higher fuel mileage requirements on passenger safety and job losses in the auto industry, a stiffer test than contained in the current law.

The amendment sponsored by Michigan Democrat Carl Levin and Missouri Republican Christopher Bond, which passed 62-38, does not call for specific increases in vehicle fuel economy and leaves it to the Transportation Department to decide.

Separately, the Senate voted 56-44 on an amendment to exempt pickup trucks from future increases in vehicle fuel standards. The amendment, offered by Democrat Zell Miller of Georgia, maintains the current fuel standard of 20.7 miles per gallon for pickups. Supporters of the amendment argued that pickups were primarily used by construction workers, farmers and other businesses that would suffer if the trucks had to be made smaller to meet stricter requirements.

D. US Biggest Oil Consumer

Under the Kerry-McCain proposal, automakers would have had to increase the combined Corporate Average Fuel Economy of cars and sport utility vehicles from the current 24 miles per gallon to 36 mpg by 2015. The Kerry-McCain proposal would have cut oil imports by about 1 million barrels per day and reduced pollution.

Gasoline demand accounts for 44 percent of the nation's average oil consumption of 19.8 million barrels per day.

E. Important Role of SUVs

When Congress adopted the original fuel standards nearly 30 years ago, most Americans drove cars and sedans. Today, however, more than half of all new vehicles sold in the nation are sport utility vehicles, minivans and other light trucks.

F. Tax Incentives

The Levin-Bond plan provides a tax credit of up to \$6,000 for buyers of electric vehicles. It would also offer an \$11,000 tax credit for fuel-cell vehicles and a \$5,000 tax credit for cars that run on combined gasoline and electric engines.

Service stations would also be able to deduct up to \$100,000 in the first year they install alternative refueling equipment like pumps and storage tanks.

In addition, the federal government would be required to purchase more hybrid and alternative fuel vehicles.

G. Tier 2 Threat

In a very important side debate, automakers indicated that they wanted the EPA to loosen its Tier 2 rules to make way for more diesels. Diesels get better fuel economy than comparable gasoline engines, so they would help automakers meet an expected CAFE increase under

consideration in the Senate. But today's diesels emit more nitrogen oxides and soot particulates than comparable gasoline engines, which means automakers have more work to do before they can get their diesels to meet the increasingly stringent Tier 2 rules.

Stepping into the debate, Jeffrey R. Holmstead, the EPA's assistant administrator for air and radiation, said that loosening the government's so-called Tier 2 emissions rules would be "a mistake" and isn't necessary. His comments came several days after Sen. John Kerry, (D., Mass), suggested he would support loosening the Tier 2 rules as part of his push for a significant toughening of another federal standard: the Corporate Average Fuel Economy, or CAFE, rule.

"My sense is the Tier 2 structure will accommodate as many diesels as anybody will want to sell," Mr. Holmstead said. Moreover, "I think it's important for the industry to stand up and say all these technologies meet the same [air-pollution] standard," he said, explaining that Americans aren't likely to accept diesels widely as an alternative to gasoline-powered engines unless they are convinced diesels are as environmentally friendly in all respects.

H. 'Real-World' Mileage Tests

A little-noticed clause in the Senate bill would have given automakers an additional hurdle to overcome by making government mileage tests more closely match what drivers get

on the road.

The current method used by the government to estimate a vehicle's fuel economy produces two sets of numbers - one for automakers and regulators, and a lower set for consumers to see on window stickers that estimates real-world results. According to data used for the federal fuel economy program, automakers averaged 24.5 miles (39.4 km) per gallon in vehicles sold during the 2001 model year. But according to the U.S. Environmental Protection Agency, which conducts the tests, the adjusted average for 2001 was 20.4 mpg (32.8 kpg).

The Senate bill would have required the EPA to study the difference between its tests and how vehicles actually perform and come up with a plan to reduce the error to less than 5 percent by 2015.

Environmentalists contend more accurate tests would give a truer picture of growing oil consumption and greenhouse-gas emissions from cars and trucks. But automakers say changing the EPA tests would have the same effect and that there may be few ways to make the tests more accurate.

The basic design of the tests has not changed since their introduction in the mid-1970s. At its labs in Ann Arbor, Michigan, the EPA puts vehicles through two tests to simulate city driving and highway driving. To get the figures buyers see, the EPA reduces the city results by 10 percent and the highway results by 22 percent.

**I. NAS Study
Congress Requested,
Ignored**

The National Academy of Sciences recommended last July that Congress should overhaul the fuel standards, first adopted in 1975. The standards should be based not on whether a vehicle is a car or a truck, the academy said, but on its weight.

The academy also said a car company achieving rates better than the standards should get credits that could be sold to other car companies that fall short of the standards. This would create a market incentive for manufacturers to increase fuel efficiency, the academy said.

Yet the academy said that despite their flaws, the mileage standards had "significantly reduced U.S. gasoline consumption." Gasoline consumption is down 2.8 million barrels a day from what it would have been without the standards, it said.

But such arguments were lost in the debate.

If passed, the overall energy legislation would still have to be reconciled with a very different energy bill passed last year by the Republican-controlled House of Representatives.

**11.EPA Regulatory Enforcement
Chief Resigns**

The head of the Environmental Protection Agency's regulatory enforcement office resigned while criticizing the Bush administration for

not cracking down on polluting power plants. In a letter to EPA chief Christine Todd Whitman, Eric Schaeffer said he could not leave "without sharing my frustration about the fate of (EPA) enforcement actions against power companies."

Schaeffer, who worked at EPA for 12 years and served the last five as director of the agency's Office of Regulatory Enforcement, accused the Bush administration of trying to weaken federal clean air laws and undermine the agency's lawsuits against power plants.

"At their heart, these proposals would turn narrow exemptions into larger loopholes that would allow 'old grand fathered' plants to be continually rebuilt (and emissions to increase) without modern pollution controls," said Schaeffer, who had planned some time ago to leave EPA.

Schaeffer said several utilities have refused to sign negotiated settlements with the agency for more than a year because the firms are "hedging their bets while waiting for the administration's Clean Air Act reform proposals."

He also slammed the new Bush budget that would cut 200 EPA staff positions, which Schaeffer said would further weaken the agency's enforcement program.

12. EPA To Ease Coal Plant Rules, Pollution Suits

Subsequently, the Bush administration announced that it has decided to shift from a Clinton-era

clean air enforcement initiative that led to dozens of lawsuits against aging coal-fired power plants. The administration plans to unveil new rules that would offer incentives for reductions in emissions without threatening legal action against plant operators.

The administration apparently wants to encourage the plants to take voluntary steps to reduce emissions, and is seeking legislation to force cuts in pollution at plants that don't voluntarily cooperate.

EPA and White House officials said the decision came after nearly a year of debate and attempts to balance the needs to protect the environment and the economy.

The shift will leave in limbo dozens of lawsuits brought by the Justice Department under the Clean Air Act.

The EPA has been working on an overhaul of the legislation's New Source Review rules. The rules, which were strictly enforced by the Clinton administration, require electric power plants, oil refineries and other industrial plants to install air pollution equipment when they make significant modifications or repairs. Currently the federal government can sue the utilities if they do not agree to anti-pollution upgrades.

The industry and Bush administration claim the regulations prevent more refineries and power plants from being built or expanded, reducing available energy supplies.

Environmentalists believe the overhaul of the rules will result in a partial repeal of the 1970 Clean Air Act, leaving loopholes that will let utilities pollute more with fewer penalties.

13. Senator Says Documents Show EPA Cutting Enforcement

Internal documents from the Environmental Protection Agency (EPA) show cuts in the number of agency employees who police anti-pollution efforts according to Senator Barbara Boxer. The number of EPA employees who enforce the nation's environmental laws fell 13 percent from 2001 to 2002 and would fall an additional 6 percent in 2003, according to agency documents released by California Democrat Boxer at a Senate hearing.

The U.S. Congress still must debate and approve the 2003 budget submitted by the Bush administration in February.

Boxer called the Bush administration's proposed cut in the EPA's 2003 enforcement budget "a stealth attack on the health of Americans." Fewer EPA enforcement staff will hinder efforts to enforce laws ranging from the Clean Air Act to asbestos in schools and toxic sludge, she said at a Senate Environment and Public Works Committee hearing.

Green groups have accused the Bush administration of ignoring or reversing several environmental protection rules disliked by industry as costly and cumbersome. Some companies that had been close to

settling pollution cases with the agency are now backing away because of the perception that the EPA is cutting enforcement efforts, the environmental groups say.

The EPA said its budget numbers are misunderstood and that there are no cuts planned for enforcement staff.

"The budget for federal environmental enforcement programs is being cut, and we are losing expertise as a result," said Eric Schaeffer, the former director of EPA's Office of Regulatory Enforcement, at the hearing. Schaeffer resigned recently (see above), citing a "political attack" on the EPA's efforts to rein in companies that pollute.

Boxer based her criticism on EPA documents that show cuts in so-called "full-time equivalent" positions for agency employees involved in compliance monitoring and civil enforcement. The documents, obtained by Boxer from an undisclosed source, included a spreadsheet giving detailed data about the agency's enforcement budget. Boxer had previously asked top EPA officials to provide the data, but the agency declined.

Separately, staff budgeted to bring court cases against offenders fell about 8 percent to 848.1 equivalent positions in 2003 from 954.8 positions in 2001, the EPA document shows. Those numbers do not include enforcement of EPA's Superfund program.

The EPA documents also show the number of planned EPA inspections falling to 14,000 in 2003 from 17,812 in 2001, a 21 percent decrease.

14. Another US Study Indicts Particulate Air Pollution As A Cause Of Premature Death

Long-term exposure to levels of air pollution common in many US metropolitan areas increases the risk of death from lung cancer and other heart-lung diseases, according to a new study published in the Journal of the American Medical Association.¹

The analysis is based on data collected by the American Cancer Society (ACS) as part of the Cancer Prevention Study II (CPS-II), an ongoing prospective mortality study of approximately 1.2 million adults. ACS volunteers enrolled individual participants in the fall of 1982. Participants resided in all 50 states, the District of Columbia, and Puerto Rico, and was restricted to persons who were aged 30 years or older and who were members of households with at least 1 individual aged 45 years or older. Participants completed a confidential questionnaire, which included questions about age, sex, weight, height, smoking history, alcohol use, occupational exposures, diet, education, marital status, and other

¹ *“Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution”, C. Arden Pope III, PhD; Richard T. Burnett, PhD; Michael J. Thun, MD; Eugenia E. Calle, PhD; Daniel Krewski, PhD; Kazuhiko Ito, PhD; George D. Thurston, ScD, Journal of the American Medical Association, Vol. 287 No. 9, March 6, 2002*

characteristics.

This study demonstrated associations between ambient fine particulate air pollution and elevated risks of both cardiopulmonary and lung cancer mortality. **Each 10- $\mu\text{g}/\text{m}^3$ elevation in long-term average $\text{PM}_{2.5}$ ambient concentrations was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality, respectively**, although the magnitude of the effect somewhat depended on the time frame of pollution monitoring. In addition, this analysis addresses many of the important questions concerning the earlier, more limited analysis of the large CPS-II cohort, including the following issues.

- **First, does the apparent association between pollution and mortality persist with longer follow-up and as the cohort ages and dies?** The present analysis more than doubled the follow-up time to more than 16 years, resulting in approximately triple the number of deaths, yet the associations between pollution and mortality persisted.
- **Second, can the association between fine particulate air pollution and increased cardiopulmonary and lung cancer mortality be due to inadequate control of important individual risk factors?** After aggressively controlling for smoking, the estimated fine particulate pollution effect on mortality was

remarkably robust. When the analysis was stratified by smoking status, the estimated pollution effect on both cardiopulmonary and lung cancer mortality was strongest for never smokers vs. former or current smokers. This analysis also controlled for education, marital status, BMI, and alcohol consumption. This analysis used improved variables to control for occupational exposures and incorporated diet variables that accounted for total fat consumption, as well as for consumption of vegetables, citrus, and high-fiber grains. The mortality associations with fine particulate air pollution were largely unaffected by the inclusion of these individual risk factors in the models. The data on smoking and other individual risk factors, however, were obtained directly by questionnaire at time of enrollment and do not reflect changes that may have occurred following enrollment. The lack of risk factor follow-up data results in some misclassification of exposure, reduces the precision of control for risk factors, and constrains our ability to differentiate time dependency.

- **Third, are the associations between fine particulate air pollution and mortality due to regional or other spatial differences that are not adequately controlled for in the analysis?** In this analysis, significant spatial autocorrelation was not observed after controlling for fine particulate air

pollution and the various individual risk factors. Furthermore, even after accounting for random effects across metropolitan areas and aggressively modeling a spatial structure that accounts for regional differences, the association between fine particulate air pollution and cardiopulmonary and lung cancer mortality persists.

- **Fourth, is mortality associated primarily with fine particulate air pollution or is mortality also associated with other measures of particulate air pollution, such as PM₁₀, total suspended particles, or with various gaseous pollutants?** Elevated mortality risks were associated primarily with measures of fine particulate and sulfur oxide pollution. Coarse particles and gaseous pollutants, except for sulfur dioxide, were generally not significantly associated with elevated mortality risk.
- **Fifth, what is the shape of the concentration-response function?** Within the range of pollution observed in this analysis, the concentration-response function appears to be monotonic and nearly linear. However, this does not preclude a leveling off (or even steepening) at much higher levels of air pollution.
- **Sixth, how large is the estimated mortality effect of exposure to fine particulate air pollution relative to other risk factors?** A detailed description and interpretation of the many

individual risk factors that are controlled for in the analysis goes well beyond the scope of this report. However, the mortality risk associated with cigarette smoking has been well documented. The risk imposed by exposure to fine particulate air pollution is obviously much smaller than the risk of cigarette smoking. Another risk factor that has been well documented is body mass as measured by BMI. Mortality risks associated with fine particulate air pollution at levels found in more polluted US metropolitan areas are less than those associated with substantial obesity (grade 3 overweight), but comparable with the estimated effect of being moderately overweight (grade 1 to 2).

In conclusion, the findings of this study provide the strongest evidence to date that long-term exposure to fine particulate air pollution common to many US metropolitan areas is an important risk factor for cardiopulmonary mortality. In addition, the large cohort and extended follow-up have provided an unprecedented opportunity to evaluate associations between air pollution and lung cancer mortality. Elevated fine particulate air pollution exposures were associated with significant increases in lung cancer mortality. Although potential effects of other unaccounted for factors cannot be excluded with certainty, **the associations between fine particulate air pollution and lung cancer mortality, as well as cardiopulmonary mortality, are observed even after controlling**

for cigarette smoking, BMI, diet, occupational exposure, other individual risk factors, and after controlling for regional and other spatial differences.

15. Pollution Found To Constrict Blood Vessels

Air pollution causes the blood vessels of healthy people to close up, which helps explain why high levels of pollution are linked to heart attacks and other cardiovascular problems, according to a new study. The study fits in with other research that shows air pollution can cause not only breathing problems, but also heart problems.

"These findings suggest a possible reason why the rate of heart attacks and other cardiovascular events increases with exposure to air pollution for people with known heart and blood vessel disease," Dr. Robert Brook, a specialist in the biology of blood vessels at the University of Michigan who helped lead the study, said in a statement.

Brook and his brother, Dr. Jeffrey Brook of the University of Toronto, tested 25 healthy volunteers with an average age of 35. They sat in a chamber and air was pumped in - sometimes filtered, and sometimes containing ozone and fine particulate matter.

The tiny particles of carbon and other material have even smaller bits of iron, manganese and zinc clinging to them. They are inhaled deep into the lungs and some studies suggest they may be absorbed directly into the bloodstream.

Brook said the body's immune system might mistake these particles for bacterial or viral invaders, and attack. As white blood cells move in, they release inflammatory chemicals called cytokines that cause the blood vessels to constrict.

These bits of metal may also damage healthy cells.

After two hours of breathing the polluted air, the blood vessels of the volunteers constricted between 2 percent and 4 percent on average, Brook and his team reported in the journal *Circulation*.

Their vessels did not constrict when they breathed clean, filtered air.

16. Study Indicates Highway Diesel Fuel Supply Will Likely Be Sufficient To Meet Demand

The nation's supply of highway diesel fuel, under a recently adopted regulation to cap sulfur content at 15 parts per million (ppm), likely will meet passenger and commercial transportation needs in 2006, according to a study released by the Alliance of Automobile Manufacturers and the Engine Manufacturers Association. The study, conducted by MathPro Inc., addresses petroleum industry claims that diesel fuel might be in short supply in 2006, when the fuel must meet ultra low sulfur diesel (ULSD) standards required by the U.S. Environmental Protection Agency (EPA) as part of its emissions reduction programs. The 79-page study assumed that EPA would require a 100 percent introduction of

ULSD in 2006, which is more challenging than the actual program requirements. Refiners have several methods to comply with the program, including a phase-in of ULSD.

The study examined regional markets for refined products and concluded that refineries are likely to find the economic driving forces for investment in ULSD capacity to be substantial, and alternatives to ULSD to be unattractive. Importantly, the study also concluded that domestic and offshore market forces would make widespread abandonment of the highway diesel fuel market unattractive to refiners. An analysis of economies of scale suggested that refineries -- especially small refineries-- with high cost ULSD production could reduce their costs significantly by participating in joint production arrangements. Importantly, the study also concluded that domestic and offshore market forces would make widespread abandonment of the highway diesel fuel market unattractive to refiners.

17. Toyota Settles California Recall Suit

Toyota Motor Corp said it had settled a lawsuit brought by the State of California over pollution concerns, going a long way towards resolving one of two quality issues hanging over the automaker in the United States, its biggest market. Toyota said it settled the suit for \$7.9 million but acknowledged no wrongdoing. The dispute concerned a recall order by the California Air Resources Board, which had claimed 330,000 Toyota vehicles had faulty emission

control systems.

A similar lawsuit by the U.S. Justice Department, which has called for the recall of 1.8 million vehicles outside California and up to \$58 billion in civil penalties, remains pending.

Toyota, the world's third-biggest automaker, declined to comment on the prospects for settlement of that suit.

The four-year old dispute began when CARB, a division of the California Environmental Protection Agency, ordered a recall in 1998 of all 1996-1998 model-year Toyota and Lexus cars made for sale in California. Toyota has contended that the Air Resources Board was using new standards put in place after Toyota's design was approved in 1995.

Under the settlement, Toyota will pay \$4.3 million to environmental projects and \$1.2 million to the California Air Pollution Fund. The automaker, one of the leaders in the industry for green vehicles, also agreed to strengthen its eco-friendly technology.

It will also extend warranties for defects that may occur in the emission control systems for the 330,000 cars from three years or 50,000 miles (80,650 km) to 14 years or 150,000 miles (242,000 km).

18. CARB Continues To Move Forward With Clean Air Plan

The California Air Resources Board (ARB) staff will hold the third in a series of workshops to discuss its

proposed **Clean Air Plan: Strategies for a Healthy Future** on April 2-5, 2002. The first two series of workshops were held in February, March, and May 2001. The Clean Air Plan is designed to provide near-term public health benefits through new emission reduction strategies and to articulate a long-term vision for California's air quality program.

Specifically, the Plan would define new strategies to help meet air quality standards for ozone and particulate matter, including federal standards with legal deadlines for attainment. These strategies would provide the basis for new ARB commitments and federal measures in upcoming revisions to regional clean air plans.

With regard to mobile sources, the draft proposals are very broad and all encompassing. Over the next decade, ARB expects to see great technological advances through the development, commercialization, and use of zero- and near-zero emission technologies as well as further development of clean and alternative fuels. These emerging technologies hold promise for several reasons: tailpipe, evaporative and fuel marketing emissions will be eliminated, emission control equipment deterioration or failure will be a thing of the past, toxic and greenhouse gas emissions will be substantially reduced, and emissions associated with the traditional fuels infrastructure will be significantly reduced.

ARB's strategy for achieving

additional emissions reductions from the mobile source emissions inventory can be grouped into four approaches: (a) technology forcing new engine standards; (b) reduce emissions from the in-use fleet; (c) require clean fuels, support alternative fuels and reduce petroleum dependency; and (d) build toward future technology and infrastructure. These four strategies would be implemented via the mobile source and fuels measure cited in this volume.

J. Technology-Forcing New Engine Standards

Technology-forcing emission standards for new vehicles and engines have been at the heart of ARB's mobile source control program. Progressively more stringent emission standards have helped spur improvements in combustion efficiency and advanced engine and aftertreatment technology. For many mobile source categories, more stringent standards were adopted under the existing program, and will be phased-in between now and 2010. To achieve and maintain healthful air quality for California residents in the face of increased population, increased vehicle miles traveled, and increased equipment usage, the push toward zero-emission technology is absolutely essential. Thus, ARB is proposing the next round of emission standards, which will be adopted during this decade and realize substantial emission benefits by 2020.

The most significant new emissions standards in the Clean Air Plan are

the Tier 4 emission standards for diesel off-road engines and for diesel recreational marine engines. The new standards would produce estimated emissions benefits of 109 tpd NO_x and 12 tpd ROG by 2020.

Also proposed are new standards for large spark-ignited engines, including forklifts. Standards for new personal watercraft (PWC) and outboard boat engines would require PWC and outboard engine manufacturers to meet the same catalyst-based standards as inboard and stern drive engines in 2010 (REC MARINE-1). New standards are also proposed for small off-road equipment (lawnmowers, leaf blowers, etc.), for light-duty vehicles, gasoline trucks, off-road motorcycles, harbor craft, ships, aircraft, and locomotives.

K. Reduce Emissions from the In-Use Fleet.

Incentive-based programs using public funds have been successful in reducing emissions of ROG and NO_x. Some incentive programs, for example the ARB's Lower-Emission School Bus Program and the Carl Moyer Program, are also achieving particulate matter (PM) reductions. However, the implementation of incentive-based programs was never intended to relieve the private sector of its ultimate responsibility to reduce emissions from the existing vehicle fleet. Therefore, the ARB must now consider additional options that require the aging vehicle and equipment fleet within California to reduce emissions and the associated impacts on its state's air quality over the next ten years.

One approach is to reduce emissions from existing vehicles and equipment through regulations that require vehicle/equipment retrofits, engine repowers, operational controls, or the use of cleaner fuels. An integral component of this strategy is to encourage an aggressive maintenance program through enhanced compliance and enforcement oversight.

Light- and Medium-Duty Vehicles:

There is a wide disparity in emissions between pre- and post-1998 light-duty vehicles. This variation is primarily due to the technological advancements in motor vehicle controls and vehicle design that occurred beginning in 1998, and the results of overall deterioration in the aging motor vehicle fleet.

The ARB is currently conducting a Pilot Program to test both light- and medium-duty vehicles to determine the most effective means of reducing in-use emissions. Vehicle testing under the Pilot Program, that targets model year 1995 and older vehicles, will be completed by the end of 2003. ARB will monitor future Smog Check inspection results of all vehicles that participated in the Pilot Program to verify the long-term effectiveness of the parts replacement/repair program. The results of the Pilot Program will be used to determine the emission benefits and estimated costs of implementing one or more light- and medium-duty vehicle parts replacement/repair programs. If the results indicate that a

replacement/repair strategy is effective, ARB will consider adopting this strategy to reduce in-use emissions from the light- and medium-duty vehicle fleet.

Heavy-Duty Vehicles and Equipment:

The ARB must also focus its efforts on reducing emissions from in-use on- and off-road heavy-duty diesel vehicle and equipment fleets. While stringent new emission standards will result in significant reductions – this will only occur over time. The durability and performance reliability of the heavy-duty diesel engine means that each one remains in service for an extended period of time, typically 500,000 miles to a million or more miles, diluting the near-term emissions impact of standards targeting only new engines. For both on-road and off-road diesel engines, the ARB will be considering several strategies to reduce in-use emissions. Some examples of these strategies are fleet rules to reduce PM emissions, accelerated fleet turnover or upgrade programs (which may include a push to use alternative fuels), and idling restrictions. Another potential strategy the ARB will consider is an engine recalibration program that specifically targets 1993 through 1998 model year on-road heavy-duty diesel engines. This program can significantly reduce NOx emissions by eliminating an engine's advanced computer controls that produce excess NOx emissions during typical on-highway driving conditions.

L. Require Clean Fuels, Support Alternative Fuels and

Reduce Petroleum Dependency

Cleaner conventional and alternative fuels will reduce emissions and enable the new technology proposed in this Clean Air Plan.

One proposed fuels measure would lower the maximum sulfur content allowed in diesel fuel to 15 ppm by 2006, and significantly reduce diesel PM levels for on-road and off-road vehicles statewide. Low sulfur diesel fuel would enable technologies, such as catalyzed diesel particulate filters and NOx adsorbers that could significantly reduce emissions from on- and off-road engines. Additional measures would control the sulfur in lubricating oil and set additive standards for diesel fuel to control engine deposits.

ARB is proposing introduction of Phase IV reformulated gasoline in the post-2010 time frame. The Phase IV gasoline regulation would further control gasoline sulfur levels and other fuel properties, optimizing the fuel to support future vehicle engine technologies.

While tighter fuel specifications can enable the next generation of vehicle and equipment technology, alternative fuels and alternative diesel fuels can reduce emissions in the near-term. There are several mobile source and fuels measures that provide for the use of alternative fuels or alternative diesel fuels to yield near-term emissions benefits. Another near-term measure is the increased enforcement of existing fuel standards in Southern California, which would ensure that the full

benefits of adopted fuels specifications are achieved.

One sure way to reduce emissions from fuels is to use less of it. ARB will pursue approaches to reduce petroleum dependency, including looking at fuel and energy efficiency, advanced technologies, alternative fuels and alternative diesel fuels, lowering travel demand, and reducing upstream emissions.

M. Build Toward Future Technologies and Infrastructure

ARB believes that it must move beyond traditional technologies such as the internal combustion engine to achieve its long-term clean air goals. Consequently, its future efforts will involve fundamental shifts to new technologies and fuels. One of its continuing goals is to encourage the development, commercialization, and use of zero- and near-zero emission technologies in the post-2010 timeframe. ARB's ZEV program has been a major catalyst in the research and development of a variety of technologies for the mobile sector. Fuel cell technology is the most likely candidate to replace today's technology in the post-2010 timeframe. Other technologies, including hybrid-electrics and micro-turbines are being developed.

In anticipation of the move toward advanced technologies, a proposed measure to provide support infrastructure for zero-emission vehicles, including electric, fuel cell, and hydrogen vehicles would ensure that ARB takes a proactive role in the development of the infrastructure

for the vehicles of the future.

19. Study Says California Should Defer MTBE Ban Until 2005; Governor Listens

California, the largest gasoline market in the U.S., should defer its scheduled phase out of the clean-gasoline additive MTBE until 2005 if it wants to avoid fuel shortages and price spikes, according to a study commissioned by the California Energy Commission (CEC). If the phase out continues as scheduled for Dec. 31: "It will result in a supply shortfall of 5 to 10 percent for the California gasoline pool as a whole," the study, unveiled at a meeting on the issue in Sacramento by consulting group Stillwater Associates, said.

"A 5 to 10 percent shortfall translates into price levels 50 to 100 percent higher than normal, i.e.. prices will move in the range of \$2 to \$3 per gallon when crude oil pricing and refinery operations would normally have resulted in pricing around \$1.50 per gallon," the study continued.

Current federal regulations require the use of an oxygen-enhancing additive to be used in mandated reformulated gasoline. MTBE has emerged as the "oxygenate" of choice.

Although MTBE has succeeded in helping fuel burn more cleanly, over the years, it has been dogged by findings that it is contaminating ground water and by some studies suggesting it a suspected carcinogen, leading California and at least a dozen other states to ban its

use.

MTBE's troubles equal an opportunity to its only possible alternative, corn-based ethanol. But ethanol has its own problems that make the MTBE ban problematic. The alcohol, which is mostly produced in the Midwest, has chemical properties that make it difficult to transport, leading analysts to question how it can get to California without passing dramatic price increases to drivers.

Further complicating the MTBE vs. ethanol question was a decision by the U.S. Environmental Protection Agency (EPA) last year denying California's request to make the state's cleaner-burning gasoline without either oxygenate.

Following release of the report, California Gov. Gray Davis put the phase out deadline off for one year in a bid to keep consumer gasoline prices in check. Davis said his decision delaying the ban on methyl tertiary butyl ether to Jan. 1, 2004 from Jan. 1, 2003 will also protect the nation's most populous state and biggest gasoline market from the sort of crippling energy crisis it faced last year.

Davis, who made the announcement at the opening of a high-tech commercial center in the coastal Los Angeles suburb of Redondo Beach, said that without the extension, Californians could see \$3 a gallon prices at the pumps next year.

Davis added his decision was made in concert with Senators Diane

Feinstein and Barbara Boxer, who are working on a compromise for the Senate energy bill. Feinstein's provisions would grant California a waiver from the oxygenate mandate since the state's strict environmental regulations are already tougher than federal standards.

The current draft of the Senate energy bill, authored by Majority Leader Tom Daschle, who represents a farm state, includes a mandate for ethanol use.

20. Last Three Months Warmest on US Record Books

The last three months were the warmest on U.S. record books, and January was the balmiest in the 123 years temperatures for the month have been recorded globally, government scientists have reported.

A preliminary average of the nation's temperature measured from November 2001 to January 2002 was 4.3 degrees Fahrenheit (2.4 degrees Celsius) above average temperatures gathered between 1895 and 2001, according to the National Oceanic and Atmospheric Administration (NOAA), the government's climate study arm.

The same monthly period in 1999-2000 held the previous record, NOAA said.

The warmth stretched from western states like Montana and Oklahoma all the way to the East Coast. Also, Minnesota, Wisconsin, Iowa, Massachusetts and Vermont saw the warmest November-January period on record, NOAA said. Abnormal

warmth sent global temperatures in January seven degrees Fahrenheit (4 degrees Celsius) above average in large parts of North America as well as in central Asia, it said.

Average global land surface temperatures were 2.43 degrees Fahrenheit (1.35 degrees Celsius) above the 1880-2001 long-term mean temperature, based on preliminary data, NOAA said.

Globally, the November-January period was the second warmest on record, 1.03 degrees Fahrenheit above average, NOAA said.

21. Honda About To Introduce Civic Hybrid

While other auto makers voice their opposition to higher U.S. fuel economy standards, Honda Motor Co. Ltd. is ramping up production of a compact sedan that gets about 50 miles (80 km) per gallon. While the gasoline-electric "hybrid" version of the popular Civic will not be sold in large enough numbers to have much impact on Honda's balance sheet, the auto maker hopes the vehicles will burnish its image as an environmentally aware company.

The Civic hybrids will be priced at about \$20,000, roughly \$3,000 more than high-end models of what now ranks as the third best-selling car in the United States. Honda hopes to sell about 2,000 hybrid Civics per month, less than 10 percent of its average monthly Civic sales, after the car makes its commercial debut next month.

The Civic follows in the footsteps of

two smaller vehicles - Honda's own Insight and Toyota Motor Corp.'s Prius sedan - as a hybrid car that boosts fuel economy by linking a gasoline engine to an electric motor and battery pack. General Motors Corp., Ford Motor Co. and the Chrysler arm of DaimlerChrysler AG have pledged to build their own hybrids in a year or two from now.

Environmentalists have touted hybrids as the quickest way to improve vehicle mileage and reduce oil consumption. President Bush and Congress have proposed special tax credits for hybrid vehicles to encourage consumer demand.

But many automakers have not been so enthusiastic, citing the extra cost of hybrids and the lack of demand among American drivers for high-mileage vehicles. At current U.S. gasoline prices, a hybrid Civic buyer would need roughly 15 years to pay off the extra \$2,000 to \$2,500 cost of the hybrid system with fuel savings.

Unlike other automakers, Honda isn't opposed to an increase in the CAFE standards, as long as the increase applies equally to all automakers and the government gives the companies time to make changes in their vehicles. It is an easier position for Honda to take, since it already has the highest corporate fuel economy average of any large automaker. Honda sells no full-size SUVs or pickup trucks and sells no engines in the United States larger than 3.5 liters. By comparison, Ford alone sold some 230,000 7.3 liter truck engines last year.

The new Civic uses a number of devices to boost its fuel economy. The 1.3-liter gasoline engine shuts down when idling at traffic stops. When the car decelerates, the engine can shut off three of its four cylinders. And the hybrid Civic gets a few aerodynamic improvements to reduce drag.

22. Canada Taking Action on Vehicles, Engines and Fuels

On February 19, 2001, Canadian Environment Minister David Anderson made public the details of a 10 year Plan of Action for cleaner vehicles, engines and fuels, an integral part of the Government of Canada's Clean Air Strategy. The Plan of Action includes measures and actions on clean air that will produce health and environmental benefits for Canadians from coast to coast. The measures, which will be supported by regulations, guidelines and studies over the coming years, were developed through extensive consultations that began last spring with provincial and territorial governments, environmental and health organizations and automobile and fuel sector representatives.

Transportation is the largest source of air pollution in Canada. The use of engines to power vehicles and equipment and the combustion of transportation fuels have major impacts on the environment and health of Canadians. Air pollution is a serious health problem. Studies show that more than 5,000 premature deaths a year across Canada can be attributed to air pollution.

N. Cars, Trucks, Off-Road Vehicles and Engines

Emissions from vehicles and engines depend upon vehicle/engine technology and the properties of the fuels. In some cases, vehicle emission control systems cannot operate properly without the right fuels. Therefore, fuel standards and vehicle/engine emission standards must be considered as an integrated system.

The Plan of Action sets out a plan to develop new Canadian emission standards for vehicles and engines, aligned with those of the United States Environmental Protection Agency. Regulations under the Canadian Environmental Protection Act and emissions control programs will be developed to reduce emissions from:

- Cars, vans, pick-up trucks and sports utility vehicles to be phased-in beginning with the 2004 model year;
- Large trucks and buses to be phased-in beginning with the 2004 model year;
- Off-road diesel vehicles and engines such as those used in the agricultural sector and by the construction industry;
- Gasoline utility engines such as those used in snow blowers, lawn mowers, chain saws; and
- Outboard marine engines and personal watercraft.

The Plan of Action also provides details on the following measures:

- The development of a Memorandum of Understanding

with automobile manufacturers to introduce low-emission vehicles in Canada for model years 2001-2003, similar to the Voluntary National Low-Emission Vehicle (NLEV) Program in the U.S. This will ensure that Canadians benefit from the latest vehicle emission control technologies; and

- The development of a Code of Practice for Heavy Duty Vehicle Inspection and Maintenance programs for use by provinces in monitoring emissions from large trucks and buses.

O. Clean Fuel Initiatives: Diesel, Gasoline and Fuel Oils

Cleaner fuels reduce pollution. The Plan of Action contains several measures aimed at protecting the health and environment of Canadians by improving the quality of diesel fuel by:

- Reducing the level of sulphur by 2006 in on-road diesel fuel used by trucks and buses, by aligning Canadian requirements with those in the United States;
- Establishing a new limit for sulphur in off-road diesel fuel used in construction and agricultural equipment; and
- Establishing a comprehensive database on diesel fuel quality in order to monitor fuel quality.

The Plan also details several measures for cleaner gasoline:

- Environment Canada will conduct further analysis on the composition of gasoline to

determine if additional controls on gasoline quality have the potential to reduce emissions of toxic substances from vehicles; and

- A Canada Gazette notice will be published requesting information on the use and release into the environment of the gasoline additive MTBE.

Environment Canada also proposes to develop measures to reduce the level of sulphur in light fuel oils used for heating homes and for heavy fuel oils used by industrial facilities.

Environment Canada will investigate complementary measures to regulations, such as economic instruments, to promote the early introduction of cleaner fuels into Canada.

23. EPA Backs Voluntary Power Plant Emissions Cuts

U.S. environmental regulators are proposing letting utilities make voluntary cuts in air emissions at aging, coal-fired power plants, abandoning the Clinton administration's policy of vigorous enforcement. The plan, outlined by the Environmental Protection Agency in documents submitted to the White House's Office of Management and Budget, marks a shift away from aggressive prosecution of utilities that refuse to install costly new anti-pollution equipment.

It is the latest in a series of environmental actions by the Bush administration which included easing limits on road building in national forests, giving mining firms more flexibility to dig for gold and copper

on public lands and cutting back energy efficiency standards for air conditioners.

The Washington Post reported the administration wanted to encourage voluntary action, but would seek legislation to force cuts in pollution at plants that do not cooperate. At issue is how far a U.S. utility can go to enlarge or upgrade an old coal-fired plant before it must invest in new air pollution technology to control smog, acid rain and soot. The Clinton administration sued nine Midwestern and Southern utilities in November 1999 to enforce the so-called "new source review" rule of the Clean Air Act.

Utilities complain that the current rule is unfair and would require new investments of billions of dollars.

In February, the administration announced its so-called "Clear Skies" initiative that calls for utilities to cut emissions of three major pollutants by 70 percent by 2018 using a cap-and-trade system. The rule exempts power plants and oil refineries built before 1977 from installing modern pollution controls unless major modifications are made to the plants.

24. California Air Board Tests Compare Diesel and CNG Bus Emissions

The California Air Resources Board (ARB) has results from a study that compares emissions from current in-use diesel and compressed natural gas (CNG) fueled buses to emissions from a similar diesel fueled bus equipped with advanced

pollution controls.

ARB Chairman Dr. Alan Lloyd said, "The data suggest that both CNG and diesel engines need additional emission controls, and with those controls both can achieve substantial and beneficial emission reductions."

Although it is known that CNG total particulate matter and nitrogen oxide emissions are lower than diesel emissions without exhaust aftertreatment, the data suggest that the levels of some toxic pollutants in CNG exhaust require further study and may warrant additional control. The in-use CNG bus tested was not equipped with a particulate filter or other proven aftertreatment equipment, such as an oxidation catalyst.

Additional tests are now being conducted that will use the same CNG bus refitted with an original equipment manufacturer's oxidation catalyst and a new, state-of-the-art CNG bus equipped with a manufacturer installed oxidation catalyst. Results of these tests should be available in mid-2002. The ARB also hopes to test a particle trap on a CNG fueled bus, and will do so when a suitable trap becomes available.

A diesel bus equipped with a new particulate filter produced promising test results for several pollutants. This bus, running on low sulfur fuel, produced lower emissions than either the diesel or CNG "baseline" buses in terms of the total mass of particulate matter (PM) and the amount of toxic organic compounds.

However, both diesel buses had higher nitrogen oxide (NOx) emissions, and the filter equipped diesel bus exhibited a substantial increase in the amount of NOx that is emitted as nitrogen dioxide (NO2). Heightened emissions of NO2 often leads to more rapid formation of atmospheric ozone and nitrate PM. Particulate filter manufacturers have acknowledged this issue, and have expressed confidence that the conversion of NOx to NO2 can be reduced.

The research study tested these buses on a dynamometer from March through June of 2001, one run on low sulfur diesel and the other on CNG. Both buses were standard, 40-passenger vehicles. Both were equipped with Detroit Diesel Series 50 engines. The diesel bus was run in two configurations; one a "baseline" with a Nelson's catalyzed muffler, and the second with the muffler removed and replaced by a new Johnson Matthey Continuously Regenerating Technology particulate filter (Diesel/CRT.)

"Both the CNG bus and the trap-equipped diesel bus produced lower emissions compared to the conventional diesel bus," Dr. Lloyd said. "When the diesel bus was refitted with a trap and run on low sulfur fuel its performance was very promising. We are working now to obtain better performance from CNG buses when they are equipped with state-of-the-art aftertreatment equipment."

25. Canada Critical of EU After Kyoto Showdown

Canada accused the European Union of behaving bizarrely by rejecting Ottawa's plea for a further dilution of the already troubled Kyoto protocol on global warming. The Canadian government, under heavy pressure from energy producers to follow Washington's lead and abandon the 1997 protocol, last year persuaded its partners to change Kyoto to give Ottawa credit for carbon dioxide absorbed by forests.

But the EU's patience snapped at a weekend meeting of Group of Eight environment ministers in Banff, Alberta, when Canadian Environment Minister David Anderson told them that Ottawa wanted another change to give it credit for clean energy exports to the United States.

The EU says the Canadian idea is badly thought out and will not work because of the decision by U.S. President George W. Bush to abandon Kyoto a year ago. But Anderson said Canada - which is the single largest supplier of energy to the power-hungry United States - would formally present the clean energy credits proposal to a meeting of experts in British Columbia next month.

But skeptics note the Canadian government is deeply divided over whether to ratify Kyoto and wonder whether Anderson is deliberately pushing an idea he knows is unacceptable as a way of effectively ditching the treaty.

Canada's most obvious quandary is that it has little chance of fulfilling its Kyoto commitment to cut emissions of the greenhouse gases blamed for global warming by 6 percent from 1990 levels by 2010. Latest estimates show that Canada's emissions actually grew by 20 percent from 1990 to 2000.

Energy producers and some powerful Canadian provinces say that ratifying Kyoto will cost tens of billions of dollars and countless jobs.

26. U.S. Successfully Pushes to Replace Watson As IPCC Chair, Pachauri Elected

The U.S. State Department April 2 said the U.S. administration will support Rajendra K. Pachauri as the next chairman of the U.N. Intergovernmental Panel on Climate Change, a move that appeared intended to scuttle the reelection bid of current chairman Robert Watson. If elected, Pachauri, the candidate proposed by the government of India, would be the first person from a developing country to chair the IPCC, widely regarded as the most authoritative body on global warming and its causes.

Pachauri defeated Watson on Friday, April 19th by a vote of 76 to 49. Seven nations voted for Jose Goldemberg, a Brazilian who entered the race this week.

Under Watson's direction, the IPCC produced its *Third Assessment Report*, which was the intergovernmental panel's comprehensive assessment of the

state of climate science that found "new and stronger evidence" indicating most of the warming of the last 50 years is attributable to human activity.

Pachauri is director-general of the New Delhi-based Tata Energy Research Institute. He has doctorates in both economics and industrial engineering and serves as a co-chair of an IPCC working group.

Operating under United Nations auspices, the IPCC is a 2,500-member expert panel that provides policymakers around the world with consensus-based assessments on global warming and its causes.

27. US Gas Guzzlers Get Another Year

Sport utility vehicles and other light trucks manufactured for the 2004 model year will be allowed to only get the same minimum average requirement of 20.7 miles per gallon (33.3 km per gallon) that has been in effect for a generation, the U.S. Transportation Department has announced. By law, the government was required to issue at this time a final rule setting model year 2004 light truck standards.

The National Highway Traffic Safety Administration also said that environmental groups, the auto industry, lawmakers and other members of the public have until May 8 to offer suggestions on possible changes to federal mileage standards in 2005 and beyond. The agency is collecting public comments before developing a proposal later this year on mileage changes.

When Congress adopted the original fuel standards nearly 30 years ago, most Americans drove passenger cars. Today, however, more than half of all new vehicles sold in the nation are SUVs, minivans or other light trucks.

Green groups and many Democrats contend that stricter fuel standards would save roughly the same amount of fuel that could be extracted from the Arctic National Wildlife Refuge, a pristine area that Republicans want to open to oil drilling.

Last month, the U.S. Senate overwhelmingly rejected an attempt by some Democrats to require American automakers to boost the fuel efficiency of gas-guzzling SUVs, minivans and pick-up trucks by 50 percent. The Senate instead approved a weaker provision requiring the Transportation Department's National Highway Traffic Safety Administration to first consider the impact of higher fuel mileage standards on passenger safety and auto industry job losses.

The U.S. Environmental Protection Agency reported earlier this year that automakers averaged 24.5 miles (39.4 kpg) per gallon in all vehicles sold during the 2001 model year.

28. Cummins Wins EPA Emissions OK

Cummins has become the first company to have a truck engine certified by the U.S. Environmental Protection Agency as meeting tougher emissions standards that

take effect Oct. 1. Similar engines are being developed by DaimlerChrysler AG's Detroit Diesel Corp. and Caterpillar Inc. but have not yet been approved. Cummins and its competitors agreed to meet the standards in Oct. 1998 when they signed a consent decree and paid an \$83.4 million total penalty. Federal regulators had alleged that the companies sold 1.3 million heavy-duty diesel engines with illegal "defeat devices" that allowed drivers to turn off emission controls during highway driving.

The EPA has proposed monetary fines for any engine makers who don't meet the new standards by the deadline, although those penalties have not been finalized.

Cummins said the EPA's certification of its new engine shows that the use of these devices, called auxiliary emissions control devices or AECDs, are permitted by law under certain operating conditions. Its technology recirculates exhaust gases that can sometimes become too hot and need to be released.

Caterpillar is working on a different technology that does not use AECDs, but it has said it does not expect to have an engine certified in time for the Oct. deadline.

Cummins and Caterpillar have been sparring for the past six months over whose engine technology will be the most reliable and fuel-efficient.

That has resulted in truck fleet operators buying heavy-duty trucks with existing engine technology

ahead of the new emissions standards. Some have said they want to test the new engines for at least a year before making a decision.

29. Energy Department Continues To Document One-Sided Process For Developing National Energy Plan

The Energy Department released the final installment of documents related to the department's role in developing the Bush administration's national energy policy last year. DOE produced the documents to comply with a federal court's schedule for turning over information requested by the Natural Resources Defense Council and Judicial Watch, a public interest law firm, under the Freedom of Information Act.

The department on March 25 released the first set of 11,000 pages of documents related to the White House energy plan.

The latest release includes about 950 pages providing more details on contacts between Energy Department officials and energy industry representatives, as well as environmentalists. The NRDC and Judicial Watch say they will contest in court the Energy Department's claim that it could not release another 15,000 pages of documents because they reflects internal communications and therefore did not have to be made public.

The papers released previously showed that Energy Secretary Spencer Abraham consulted dozens of energy industry representatives

last year before the Bush administration released its energy policy in May 2001.

While the Energy Department consulted environmentalists, this was only in a rushed effort well after industry executives had their say, government documents showed.

Environmentalists have complained they were largely snubbed by administration officials who held dozens of meetings with executives from oil, coal and utility companies while the administration drafted an energy policy widely perceived as pro-industry.

The Bush energy task force, headed by Vice President Dick Cheney, produced a policy in mid-May, which called for more oil and gas drilling, as well as a revival of nuclear power.

30. US Senate Kills Bush Plan for Alaska Drilling

In a big defeat for the Bush administration's national energy plan, the Democratic-led U.S. Senate killed a White House proposal to let oil companies drill in the Arctic National Wildlife Refuge. Republicans fell 14 votes short of getting the 60 needed under Senate rules to end debate on the controversial proposal and block a threatened filibuster by Democrats.

Five Democrats crossed party lines and supported the ANWR drilling amendment, while eight Republicans went against their party's position and backed keeping the refuge closed.

The administration and many Senate Republicans framed the ANWR debate as a national security issue, saying the refuge's potential 16 billion barrels of oil was crucial to reduce U.S. dependence on crude from unfriendly countries like Iraq.

ANWR is roughly the size of South Carolina, sprawling over 19 million acres (7.7 million hectares), on Alaska's northeast coast. Republicans offered to keep any drilling in ANWR limited to just 2,000 acres (800 hectares) at any one time.

Majority Leader Tom Daschle, a South Dakota Democrat, said the vote was an important test of Bush administration efforts to weaken environmental protections. "We are just not going to allow Republicans to destroy the environment," Daschle told reporters. "We believe that this is a dividing line between Republicans and Democrats, and we're willing to take it anywhere in the country. We feel that strongly about it."

Environmental groups praised the Senate vote.

President George W. Bush, a former Texas oilman, made drilling in ANWR the centerpiece of his proposed U.S. energy policy. The White House plan also encourages more U.S. production of natural gas, coal and nuclear power.

"At a time when oil and gas prices are rising the Senate today missed an opportunity to lead America to greater energy independence,"

White House spokesman Ari Fleischer said.

The administration may try to revive ANWR drilling in a conference committee to resolve differences between an eventual Senate energy bill and one passed earlier by the U.S. House of Representatives, Fleischer told reporters.

"The president will continue to fight for the tens of thousands of jobs that are created by opening ANWR," he said.

The Republican-led House last year approved an energy bill that would allow drilling in the refuge. If the Senate finishes a bill, lawmakers from both chambers would work out differences before a final plan could be sent to the president.

Republican Ted Stevens of Alaska said he was not giving up on ANWR drilling.

Stevens said he would offer a new amendment to allow native Americans living in ANWR the right to drill on the 92,000 acres they own. If that fails, Republicans will try to include the provision in other legislation.

During a two-day Senate debate on ANWR, Democrats said the refuge does not hold enough oil to significantly reduce U.S. imports. Also, ANWR is home to polar bears, caribou and other wildlife that would be threatened by oil drilling and its heavy equipment, roads and buildings, they said.

Senators Joseph Lieberman of

Connecticut and John Kerry of Massachusetts led the Democrats' move to kill the measure. Both are expected to be Democratic presidential hopefuls in 2004.

The ANWR issue stirred heated debate.

The Senate, which aims to finish work on the energy bill early next week, still has to consider other amendments, including ones on climate change and a multibillion dollar package of energy tax credits.

31. US Senate Kills Attempt To Scale Back Ethanol Use

The Senate has also killed an attempt to roll back strong requirements for ethanol use in a pending energy bill, and instead committed to a big boost in the corn-based fuel additive beginning in two years. California lawmakers led the effort to slow the implementation of more ethanol use, fearing high gasoline prices would result if the state was not given more time to put refineries, storage facilities and other infrastructure in place to handle the extra fuel additive that would be needed.

To help diversify U.S. energy supplies, the Senate bill calls for increasing the amount of renewable fuels such as ethanol that is blended into gasoline. Ethanol use would increase from the current 1.5 billion gallons a year to 5 billion gallons annually by 2012.

Democrat Dianne Feinstein of California had sought to modify the bill to delay by one year, until 2005,

the implementation date for the new ethanol requirements. Feinstein also proposed shortening the period that the Environmental Protection Agency would have to act on individual state requests to waive the ethanol mandate in the event of supply problems from 240 days to 30 days. Lawmakers did not vote down Feinstein's proposal outright, but they voted 61 to 36 to set aside the measure, which effectively killed it.

32. Bush Used Solar Energy Funds To Print Energy Plan

While environmentalists have slammed the White House national energy plan for not doing enough to promote renewable energy, the Bush administration found those government research programs useful in paying the bill for printing copies of the 170-page plan.

The administration took money from the Energy Department's solar and renewable energy and energy conservation budgets to pay for the cost of printing its national energy plan.

Documents released under court order by the Energy Department revealed that \$135,615 was spent from the DOE's solar, renewables and energy conservation budget to produce 10,000 copies of the White House energy plan released last May.

Another \$1,317.39 was spent for producing 16 "briefing boards" used by administration officials to illustrate and explain the White House energy plan.

The newly released documents also show that \$176.40 was taken from the energy conservation program to pay for an Alaska trip by Andrew Lundquist, the White House energy task force's staff director, to promote the energy plan.

The administration's energy policy called for drilling in Alaska's Arctic National Wildlife Refuge, a proposal strongly opposed by environmentalists.

At the same time the White House tapped the renewable budget for funds to print the energy plan, administration was urging Congress to cut the renewable and energy efficiency research budgets by more than 50 percent.

Vice President Dick Cheney, who headed the White House energy task force, criticized environmentalists for relying too much on renewables and conservation to solve the nation's energy problems. "Conservation may be a sign of personal virtue, but it is not a sufficient basis for a sound, comprehensive energy policy," Cheney said two weeks before the energy plan was released last May.

33. The Bush Administration Feels Unappreciated

The Bush administration's top environmental official admits Washington has done a bad job of selling its policies and says the abrupt way it pulled out of the Kyoto climate change protocol has helped obscure U.S. achievements. Environmental Protection Agency chief Christine Todd Whitman told reporters in Europe she was

frustrated that the United States received little credit for implementing green policies, which she said were among the most advanced in the world.

President George W. Bush triggered worldwide condemnation after pulling his country out of the Kyoto accord a year ago and Whitman has borne the brunt of the criticism as she travels the world meeting her counterparts.

True to form, some G8 delegates at the Banff meeting privately criticized Bush over Kyoto but Whitman said lost in the furor was the simple fact that the U.S. Congress would never have agreed to ratify the 1997 protocol.

Bush replaced Kyoto with a voluntary plan designed to curb greenhouse gas emissions, prompting criticism that the president - a former oil man - was caving in to the country's powerful energy lobby. But Whitman noted dryly that many of the measures that other nations, including critics of Washington, had put in place to prepare for Kyoto ratification were not mandatory.

Whitman said the United States was a world leader in the attempt to ban persistent organic pollutants and had taken the unique step of ordering the country's utilities to cut their emissions of sulfur dioxide, nitrogen oxide and mercury by 70 percent over the next 10 years.

Despite the relentless attacks over Kyoto, Whitman said she had good relations with her counterparts - some of whom were less critical in

private than in public.

34. Waterways Found To Pollute Air

Ships and boats could be polluting the air as much as do cars and lorries. A new study from the US Pacific Northwest² suggests that waterways should be included in air-pollution audits that have so far focused on industry and road traffic.

"If a single freeway needs to be included in modeling of emissions impacts, then the waterway most certainly should be," says the study's author Jim Corbett, a marine policy researcher at the University of Delaware. Corbett has found that marine vessels emit twice as much nitrogen oxides (NOx) - up to 25% of Washington State's highway emissions - as had previously been estimated. NOx are highly reactive gases implicated in a variety of environmental ills, including global warming, acid rain and smog.

"For the most part, these marine traffic emissions have been missing," agrees Brian Lamb, who models air quality at Washington State University in Seattle. Previously, emissions were assessed from ships in port - only about 10% of the total from US waters. Decreases in industry emissions over the past 30 years have enabled researchers to identify other important sources of air pollution. Three years ago Corbett showed that previously ignored ships

Corbett, K Emissions from ships in the northwestern United States. [*Environmental Science and Technology*](#), 36, 1299 - 1306, (2002).

contribute enough sulphur dioxides to the oceans' atmosphere to impact on global climate³. Now he has refined his projections to regional levels - combining analyses of fuel consumption, traffic movements and cargo loads on smaller river systems.

Thousands of boat trips on the Columbia and Snake River systems each year transport wheat, forest products and fertilizers throughout the inland Northwest. As diesel burns, it emits NOx and other haze-causing pollutants, such as particulates and sulphur dioxide. These scatter light, lower visibility and contribute to respiratory illnesses.

Hazy days are of increasing concern to regional environmental planners. Amendments to the Clean Air Act in 1990 and current Environmental Protection Agency efforts specifically call for lowered haze in environmentally protected areas, such as the Columbia River Gorge National Scenic Area. Emissions from sources other than road traffic are difficult to gauge. So standards for these have lagged behind the strict regulations for cars and vans that plan to bring road-vehicle emissions down 70% over the next 20 years.

Corbett's work suggests that similar restrictions should apply to waterway

Capaldo, J.J., Corbett, K, Kasibhatla, P., Fischbeck, P. & Pandis, S.N. Effects of ship emissions on sulphur cycling and radiative climate forcing over the ocean. *Nature*, 400, 743 - 746, (2002).

traffic. Otherwise "nonroad sources may produce more than onroad sources, at some point," says Mike Boyer, environmental scientist with the Washington Department of Ecology in Olympia, Washington.

ASIA PACIFIC REGION

35. Japan Issues Tighter Emissions Standards

Japan's Central Environmental Council on March 7 released for public comment new, more stringent requirements on tailpipe emissions for new motor vehicles to be sold in 2005 and later, including foreign-manufactured vehicles. The interim final regulation issued for comment applies both to gasoline- and diesel-powered passenger cars, trucks, and buses and sets different requirements for different classes of vehicles.

The new regulation calls for reducing PM emissions from trucks and buses by up to 85 percent and NOx emissions by 50 percent from the levels set in the short-term diesel auto emission regulation that is scheduled to be enforced between fiscal 2002 (starting April 1) and fiscal 2004 (ending March 2005).

It was put out as an interim final rule for a four-week public comment period on March 7 and is expected to be converted into a final rule in April.

Domestic products and imported vehicles that fail to meet the regulation cannot be registered for use in Japan.

Enforcement of the planned

regulation means that automakers must manufacture and sell motor vehicles that meet new emission standards by fiscal 2005.

The MOE also is preparing to enforce a tougher regulation on hydrocarbons, NOx, and SOx emitted from gasoline-powered vehicles--so-called Ultra-Low Emission Vehicles (ULEVs). The new regulation toughens the short-term emission regulation that will be in effect between April 1, 2002, and March 31, 2005 (fiscal 2002-2004).

The new emissions level would be cut to 0.027 gram per kilowatt per hour for PM from 0.18 gram per kWh under the 2002-2004 regulation, or

an 85 percent reduction. The standards for NOx emissions for the same category of trucks must be cut to 2 grams per kWh from 3.38 grams under the 2002-2004.

For gasoline-powered passenger vehicles weighing more than 1.25 tons, the new standards for PM must be less than 0.014 gram per kilowatt-hour, compared with 0.056 gram per kWh under the 2002-2004 regulation, and NOx must be less than 0.15 gram per kHz from 0.3 gram under the 2002-2004 regulation.

The Japanese New-Long-Term Regulations, decided on March 5, which will start from October 2005.

Vehicle Type	Inertia Weight	Units	NOx	NMHC	CO	PM
Diesel Passenger Vehicle	EIW<1,250kg and 1,250kg	G/km	0.14	0.024	0.63	0.013
	EIW>1,250kg	G/km	0.15	0.024	0.63	0.014
Diesel Trucks and Buses	GVW<1,750kg and 1,750kg	G/km	0.14	0.024	0.63	0.013
	1,750kg<GVW<3,500kg and 3,500kg	G/km	0.25	0.024	0.63	0.015
	3,500kg<GVW	G/kWh	2.0	0.17	2.22	0.027
Gasoline Passenger Vehicle	All	G/km	0.05	0.05	1.15	NA
Gasoline Light Duty Vehicles	All	G/km	0.05	0.05	4.02	NA
Gasoline Trucks and Buses	GVW<1,750kg and 1,750kg	G/km	0.05	0.05	1.15	NA
	1,750kg<GVW<3,500kg and 3,500kg	G/km	0.07	0.05	2.55	NA
	3,500kg<GVW	G/kWh	0.7	0.23	16.0	NA

EIW = Equivalent Inertia Weight and GVW is Gross Vehicle Weight; NA=Not Applicable

Test mode will be also changed, especially in the category 3,500kg<GVW, Transient mode will replace the steady state mode.

36. Japan Developing DME

Japan is racing to commercialize a new generation of fuel by 2006 to reduce greenhouse gas emissions and to rely less on Middle East energy imports. Two separate Japanese joint ventures - one led by Mitsubishi Gas Chemical Inc and another by Japanese steel maker NKK Corp - are aiming to begin mass production of dimethyl-ether (DME).

DME, made from natural gas, emits no sulphur oxide or particulate and only small amounts of carbon dioxide. Currently, Japan produces about 10,000 tons of DME a year, mostly for use in hair sprays.

Backers of DME say it could eventually replace liquefied petroleum gas (LPG) or gas oil as the main fuel for some vehicles and power generators. Japan imports about 15 million tons of LPG a year, the bulk from the Middle East.

Japan's government said in a recent report that it expects initially to import between 1.4 million and 2.4 million tons of DME a year from offshore Japanese plants from 2006.

The search for cleaner fuels has been a part of Japanese government policy since 1997 when industrialized nations agreed in the Japanese city of Kyoto to cut carbon dioxide emissions by an average 5.2 percent from 1990 levels by 2012.

Several hurdles need to be overcome before DME can be widely used, including cutting its cost and getting regulatory approval in the

auto industry.

Japanese prices for LPG are set by producer Saudi Arabia, often making them less competitive than other fuels. Rising demand for LPG in Asia is also expected to push up prices over the longer-term, causing many companies to hunt out alternatives.

NKK and Mitsubishi Gas are both targeting DME production costs similar to those for production of liquefied natural gas (LNG), also a clean fuel, which currently costs about two yen per megacalorie to produce. About 129 yen equals one U.S. dollar.

Mitsubishi Gas plans to build a \$500-\$600 million plant in Western Australia by the end of 2003 with annual capacity of 1.7 million tons of DME by 2006.

NKK is considering building a DME plant in gas producing countries such as Indonesia, Australia or the Middle East.

37. Japan Truck maker Hino Talks With Scania Regarding Link

Japanese truck maker Hino Motors Ltd has announced that it is in talks with fellow truck maker Scania of Sweden on a possible tie-up. A deal would likely allow the two to share the high costs of developing environmentally friendly technology and fill out their respective product line-ups.

Hino, Japan's largest truck maker in terms of domestic market share and 50 percent owned by Toyota Motor Corp said in a statement that details

of the talks would be revealed soon.

Its statement followed a report in the Asahi Shimbun newspaper that Hino would supply Scania with regular trucks while Scania would provide Hino with heavy-duty trucks in addition to sharing development costs.

Hino would also supply engines to Scania, the paper said.

It would be the second example of Europe-Asia cooperation in trucks after DaimlerChrysler AG expanded ties with Mitsubishi Motors Corp last year.

A deal would also help Hino gain a presence in Europe and Scania a foothold in Asia.

Hino is seen as the strongest of Japan's four truck makers but the whole sector has been hit by a decade-long slump in domestic demand. Japan sales of medium-to heavy-duty trucks slid to about 80,000 vehicles last year, less than half the peak in 1990.

Demand is likely to remain weak because construction firms, the truck sector's main customers, are suffering from a sharp fall in government public works spending.

Any deal with Hino could fuel speculation of a possible bid for Scania by Toyota.

The European Commission in 2000 blocked Swedish truck rival Volvo's planned takeover of Scania and gave Volvo until January 2004 to sell

its 45 percent stake.

Scania's other main stakeholder, German automaker Volkswagen AG, with 18.7 percent of Scania's share capital and 34 percent of its voting rights, has said it is keeping its options open on the Swedish truck maker. Some of VW's shareholders have said they would like to see the German automaker sell the stake, as there are few cost savings to be made by integrating car and truck production.

German truck maker MAN has also been mentioned as a possible bidder for Scania.

38. Developments in China

P. Chinese Leaders Discuss Sustainable Development

According to the US embassy officials, China's senior leaders reiterated their rhetorical support for sustainable development at this year's annual gathering of the National People's Congress (NPC) and Chinese People's Political Consultative Conference (CPPCC). Unlike some previous years, however, the sessions produced little in the way of significant new initiatives or policy shifts on environmental protection or public health.

The NPC, China's national legislature, normally meets for 10 days in early March, immediately following the annual meeting of the CPPCC, a "united front" organization dating from the 1949 revolution through which the Chinese

Communist Party gathers opinions from other elements of Chinese society. Typically, other high-level meetings on specific topics are convened while the NPC and CPPCC are in session. For instance, this year President Jiang Zemin delivered a major address at a March 10 conference on population, resources and environment, which received prominent media coverage but broke no new ground.

Q. Deputies Float Specific Proposals on Environment and Health

This year, NPC deputies tabled 1,194 proposals, of which 77 were referred to the Committee on Resources and the Environment for study. Included among them were a recycling bill, a draft law on comprehensive management of the Bohai Bay and draft provisions for managing water resources along the middle course of the proposed South-North Water Transfer Project. Committee Chairman Qu Geping promised that a draft "clean production law" would be included in the group's legislative plan for 2002.

In practice, most bills that become law in China are prepared by the State Council, not tabled by NPC deputies on their own initiative. But the documents tabled at the annual NPC plenary provide a sense of what issues are of concern to people in the provinces.

In relative perspective, proposals by CPPCC and NPC delegates can be thought of as roughly equating to statements by individual members of the U.S. Congress made at House or Senate hearings -- non-binding, but pointing in a certain direction for policymakers to consider.

R. Beijing Air Quality Improving

Beijing is showing continued progress in its 30-month-old clean air campaign, claiming that air quality in the capital met or exceeded national standards on 185 days last year. This is up from 177 days in 2000 and 100 days in 1998. City officials credit this success to their efforts since late 1998 to replace small coal-fired boilers in the city with gas and electric versions, reduce surface dust and more tightly regulate automobile emissions. The goal for this year is 200 days meeting or exceeding national standards.

Municipal authorities report that the average daily concentration of sulfur dioxide (SO₂) in the city's air in 2001 was 46.7% lower than in 1998; nitrogen oxides (NO_x) were down 16.4%, nitrogen dioxide (NO₂) was down 4% and carbon monoxide (CO) was down 21.2%. They did not comment on the trend for particulate matter. The following table shows estimated actual pollutant concentrations in micrograms per cubic meter, extrapolated from data reported for earlier years.

	SO₂	NO_x	NO₂	CO	PM₁₀
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1998	120	152	N/a	3,300	N/a
1999	80	140	77	2,900	180
2000	71	124	71	2,700	162
2001	64	127	N/a	2,600	N/a
China Standard	60		80	4,000	100
WHO guideline	40		50	10,000	
U.S. Standard	80		100	10,000	50

(Standards are for annual exposure, except CO, for which the China standard is based on daily exposure and the U.S. and WHO standards are for eight-hour exposure; PM₁₀ stands for suspended particles less than 10 microns in diameter.)

S. In Brief:

In the face of China's accession into the WTO, the vehicle market is changing rapidly. Sales of automobiles in China in the first three months of the year amounted to 640,000 units, up 14.5 percent from the same period in 2001, according to the China Association of Automotive Manufacturers.

The First Auto Works (FAW) produced and sold 123,204 and 115,961 units of automobiles in the first three months of the year, up 20.2 and 27 percent respectively from the same period of last year.

Shanghai Automotive Industry Corp. with Volkswagen AG signed an agreement on April 12 to extend their joint venture, Shanghai-VW Automobile Co., Ltd., for another 20 years to 2030, according to a recent Xinhua News Agency report. The total registered capital of the joint venture will increase to ¥6.3 billion from the current ¥4.6 billion.

The Honda Odyssey, an MPV model made by Guangzhou Honda Automobile Co., Ltd., rolled off the production line on April 10. Retail price for the Odyssey is ¥298,000.

A special edition of the 1.8-liter Passat without cruise control, electric seat, wooden interior and automatic air conditioner, was recently introduced to the Beijing market at a price of ¥225,600.

A 1.2-liter Changhe Beidouxing made by Changhe-Suzuki Automobile Co., Ltd. based on Suzuki's WagonR was launched recently in the Beijing market.

The price of the Transit series light van made by Jiangling Motors Corp. were slashed by ¥20,000 beginning April 10, with the exception of the 17-seat high roof model which was reduced by ¥10,000.

Nanya Automobile Co., Ltd. based in Nanjing of Jiangsu Province reduced the price of the Eagle and Unique series cars on April 12 by ¥6,000-¥10,100.

The United Nations Environment Program (UNEP) has chosen Shenzhen, Guangdong Province as the host city for the 2002 World Environment Day on June 5.

Work has been completed on the basic undercarriage of the 31-kilometer Shanghai to Pudong Airport magnetic levitation train track. Upon completion of the 8.9 billion RMB (\$1 billion) project, trains will travel at 430 kph, delivering passengers from town to airport in 7 minutes. This will be the world's first commercial maglev track.

China had 1.7 million kilometers of public roads at the end of 2001, according to the Ministry of Transportation, putting China in 4th place worldwide. Of this, 19,000 kilometers are limited-access highways (2nd place in the world).

China produced and sold 12,366,966 and 12,130,478 units of motorcycles last year, according to statistics from the Motorcycle Division of China Association of Automotive Manufacturers, up 7.19 and 5.76 percent, respectively, from those of 2000.

39. Setting a PM2.5 Standard in Australia Under Discussion

The role of the National Environment Protection Council (NEPC), as a statutory entity within the recently established Environment Protection and Heritage Council (EPHC), is to harmonize environmental protection approaches across Australia. In 1998, Australia adopted an Ambient Air Quality National Environment Protection Measure (NEPM) that set

national ambient air quality standards to apply in all States and Territories and over land controlled by the Commonwealth. These standards cover six criteria pollutants – particles (as PM10), ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide and lead.

When NEPC made the Ambient Air Quality NEPM, it also agreed to a program of future actions, including a staged review of some NEPM standards. The future action program included a review of the particles standard to commence by 2001.

The current particles standard relates to particles of 10 micrometers or less in diameter (PM10). In December 2000, NEPC resolved to conduct a review to determine whether a new ambient air quality standard for PM2.5 (particles 2.5 micrometers or less in size) is needed in Australia, and the feasibility of developing such a standard.

The report of the review was presented to NEPC in September 2001.

Following consideration of the report of the review in September 2001, NEPC announced the start of a formal process to vary the Ambient Air Quality NEPM to extend its coverage to PM2.5.

The process proposed to develop a standard for PM2.5 includes:

- Examining a risk assessment approach;
- Examining overseas benchmarks;
- Seeking expert advice on data

availability; and

- Devising a tailored approach to hazard identification, dose-response relationships and exposure assessment.

Variation to the National Environment Protection (Ambient Air Quality) Measure Hazard identification involves a review of the health effects of PM_{2.5} and identification of the sensitive population groups and health endpoints to be assessed in the standard setting process. Identification of appropriate dose-response relationships is dependent on the health endpoints being assessed and follows the hazard identification stage. Exposure assessment requires an assessment of all available PM_{2.5} data, nephelometry data and of population exposure.

The next step in the standard development process will involve characterization of the risk associated with setting a standard at a range of PM_{2.5} concentrations, followed by the development of an Impact Statement and draft variation to the Ambient Air Quality NEPM.

The Impact Statement will:

- Examine options for the structure of a variation to the NEPM (including methods of measuring, assessing and reporting PM_{2.5});
- Provide a cost effectiveness comparison of the options;
- Assess the economic, social and environmental impacts of the preferred approach; and
- Appraise any implementation issues associated with monitoring

and reporting.

A Project Team has been established to develop the draft variation and Impact Statement. A Non-Government Organization (NGO) Advisory Group (comprised of representatives from industry, community and professional groups) and a Jurisdictional Reference Network (JRN) have also been established, equivalent with the standard NEPM development process (and with the review process undertaken previously).

Individuals with recognized health and air monitoring expertise have been approached to provide peer review of relevant documentation. NEPC is also seeking to identify and access industrial and academic data sources to supplement data gathered from jurisdictional databases, and has approached individuals who may be able to provide such assistance.

The process will involve consultation at critical stages to ensure stakeholder understanding of, input into and ultimately acceptance of the process and its outcomes.

It is anticipated that the variation process will be completed by November 2002 and it is envisaged NEPC will make a decision regarding any variation to the NEPM shortly thereafter.

The first step in the process has been the preparation of a discussion paper. The discussion paper is not intended to be a comprehensive review of all literature pertaining to

PM2.5, but a document that raises key issues pivotal to the development of a PM2.5 standard.

The paper examines issues such as the health effects of PM2.5, the populations at risk, dose response relationships for Australia and exposure modeling. It is particularly aimed at establishing preferred health endpoints to be considered in the development of a PM2.5 standard.

The paper also introduces the risk-modeling phase of the process and foreshadows monitoring issues and options for the form of the NEPM variation (in addition to discussing standard setting issues). These matters will be examined in more detail in subsequent documentation.

The purpose of the paper is to encourage discussion on the issues and to enable stakeholders to provide input into the development of a new standard for PM2.5. The feedback provided will help ensure the process and its outcomes are as transparent as possible.

The final step prior to varying the NEPM will involve the preparation of a draft of the variation and an Impact Statement (as required by Section 20 of the NEPC Acts). The Impact Statement must include an assessment of environmental, economic and social impacts.

In accordance with the NEPC Acts and the NEPC Consultation Protocol, both the draft variation and the Impact Statement must be made available for public consultation.

NEPC must then have regard to the Impact Statement and submissions received during the statutory consultation period in deciding whether to adopt a proposed variation to the NEPM.

40. Taiwan Adopts Thirteen Measures to Improve Urban Air Quality

The EPA has formulated thirteen measures that specifically address the special problems of urban air pollution. These are primarily mobile source pollution control measures; however, there are also measures for regulating stationary pollution sources.

The EPA will begin promoting its ***Specific Measures for Controlling Urban Air Pollution*** in 2002. The EPA formulated these measures based specifically on studies of air pollution in the three major urban areas of Taipei City, Kaohsiung City and Taichung City.

Eight of these thirteen measures are existing air pollution control measures, while five are newly devised measures. The new measures include Importing Manufacturing Technology for Compressed Natural Gas (CNG) Buses and Bus Bodies, Expanding the Promotion of Liquefied Petroleum Gas (LPG) Vehicles, Developing Low-Pollution Electronic Fuel Injection Engines for Scooters, Air Pollution Controls for Food and Beverage Establishments and Landscaping Exposed Public Land in Urban Areas.

The EPA estimates that these thirteen measures will require over NT\$ 1 billion from the Air Pollution Control Fund after they are implemented in 2002. Controls for Motor Vehicles Already in Use and Importing Manufacturing Technology for Compressed Natural Gas (CNG) Buses and Bus Bodies, requiring NT\$ 444 million and NT\$ 270 million respectively, will account for about 70% of the total funds needed for these thirteen measures.

The EPA is pushing ahead with its six-year plan to replace diesel buses in the two major urban areas of Taipei and Kaohsiung with compressed natural gas (CNG) buses. Under this plan, the EPA will provide subsidies of NT\$2 million per bus for the purchase of CNG buses, and it looks forward to replacing 2,325 old buses in Taiwan's two largest urban areas within six years. After a disbursement report for the plan—expected to cost roughly NT\$6 billion over six years—is submitted to the Executive Yuan for approval, detailed planning and implementation will begin in 2002.

The EPA expects these two measures to significantly improve urban air quality. In particular, the Plan for the Promotion of a Regular Inspection System for Motorbikes, under the Controls for Motor Vehicles Already in Use, is predicted to cut carbon monoxide (CO) emissions by approximately 9,400 kilotons and hydrocarbons (HC) emissions by approximately 4,600 kilotons every year.

The replacement of diesel buses

with CNG buses is also expected to bring about a profound improvement in urban air quality. There are currently over 3,000 buses in Taipei City and over 500 buses in Kaohsiung City. Based on an annual distance traveled of 80,000 kilometers per bus, replacing 60% of these diesel buses (about 2,000 buses) with CNG buses is forecast to reduce emissions of nitrogen oxides (NOx) by 2,500 kilotons and cut particulate matter (PM) levels by 240 kilotons every year. This would mean a reduction of around 60% in the volume of bus-generated pollution in Taipei City and Kaohsiung City each year, making the air in these cities a great deal cleaner.

41. Lead-Free Gasoline: Emerging In Pakistan

Environmental pollution has subsided in Pakistan to some extent, thanks to the three refineries producing lead-free gasoline since July 2001. Three of the four domestic refineries, i.e. the Pak-Arab Refinery Limited (PARCO), the National Refinery Limited (NRL) and the Pakistan Refinery Limited (PRL) have taken the lead in the production of lead-free gasoline. These refineries sell their products to the oil marketing companies (OMCs) like the PSO, Shell and Caltex who retail their products to consumers.

Only one refinery - Attock Refinery Limited (ARL), - has yet to acquire the capability to refine and blend unleaded motor gasoline. Though it too, was scheduled to produce the lead-free petrol by July 2001 but could not make it. The ARL is expected to start production by June

of this year. In the meantime, Pakistani motorists in some parts of the Northern areas will still use leaded gasoline.

42.UAE Restricts Auto Imports Requiring Lead

The UAE Ministry of Finance and Industry has issued a notice "not to import gasoline-run cars unless they are designed and equipped to run with unleaded gasoline starting from 01/01/2002. Standard for unleaded gasoline should be acquired from the Directorate of Standardization & Metrology in the ministry. More pertinently a five-year period has been given starting from January 1, 2002, to those licensed cars in the country to be equipped to run on unleaded fuel.

"For quite some time now all major manufacturers are shipping in vehicles which can run on both leaded and unleaded offering car users the option to decide which fuel to use," said David Glorius, vice-president for the Chrysler/Jeep/Dodge division at DaimlerChrysler. "It becomes an issue only when leaded fuel is used in those vehicles equipped to run on unleaded gasoline alone. Obviously, the decision is going to have a very favorable impact on the environmental and health grounds." The ministry's notice is in line with the Cabinet decision No.46/4 for 2001 on the production and usage of unleaded gasoline in the UAE. The ruling, however, does not cover imports brought in for re-exports.

43.Japan Submits Kyoto Ratification, Implementation Bill to Diet for Approval

The Japanese government on March 29 approved legislation to amend the Global Warming Prevention Promotion Law and to ratify the Kyoto Protocol, and it immediately submitted the measure to the Diet (parliament), officials of the Ministry of Environment and the Ministry of Foreign Affairs said. The bill requires Japan to achieve its 6 percent greenhouse gas reduction target by 2008-2012, based on 1990 levels, and it calls for reviewing and amending the Kyoto Protocol Implementation Program in 2004 and 2007 if reduction measures during the first implementation period fail to achieve anticipated results between 2002 and 2004.

It features implementation measures contained in the Implementation Program approved and released March 19 by the Cabinet's Global Warming Prevention Policy Headquarters, which is chaired by Prime Minister Junichiro Koizumi.

That three-stage implementation plan calls on manufacturers to slash emissions by 7 percent and households to cut their greenhouse gas releases by 2 percent in order to meet Japan's overall GHG reduction target. The plan includes more than 100 measures designed to help Japan cut its overall emissions, the government said.

Those measures include programs for energy conservation, developing new energy sources, and increasing

the country's generation of nuclear power, as well as emissions trading under the Kyoto pact's flexible mechanisms.

44. Indian Supreme Court Refuses To Extend Deadline for Polluting Buses

India's Supreme Court April 5 refused to extend its deadline for switching diesel-run public transport buses to compressed natural gas (CNG) fuel in the Indian capital by Jan. 31, 2002. The court in its April 5 order blasted the federal government and the Delhi state administration for showing no concern toward the health of the people and their scant respect for the environmental laws.

The court said the pollution in the Indian capital was worse than the Bhopal gas tragedy. "Statistics show that the continuing air pollution in Delhi has a more devastating effect on the people than what was caused by the Bhopal gas tragedy," a three-judge bench comprising Justices B.N. Kirpal, V.N. Khare, and Ashok Bhan said.

"In that case, the nation, including the Indian government, was rightly agitated and sought action and compensation from the multinational company that was held to be responsible for the tragedy," the judges said. "Here, in the case of CNG, the shoe is on the other foot because the government is not facilitating measures for clean air and water, including the supply of CNG, or any other unadulterated fuel."

T. Public Interest Case

The court ruling came after the New Delhi government sought another extension to the original March 31, 2001, deadline to convert all commercial vehicles to CNG. The court is pursuing a public interest litigation petition filed by environmental activist and lawyer M.C. Mehta.

The court had ordered the fuel switch two years ago and extended the deadline several times to allow the authorities and owners of diesel-powered buses to comply.

The original deadline of March 31, 2001, had been extended to September 30 on pleas by the federal and Delhi state governments that they needed more time for the changeover. The deadline was further extended to Oct. 18 and finally to Jan. 31, 2002.

The court had slapped a fine of \$10 per day on the 8,000 diesel-fueled buses as of Feb. 1 and increased it to \$20 as of April 5.

U. Buses Taken Off Roads

As a result of the fine, more than 7,000 buses of New Delhi's state-owned as well as private bus fleet have been taken off the roads to avoid paying it.

Tens of thousands of commuters were stranded on the New Delhi roads as the majority of the buses stayed off roads. Commuters were packed like sardines in 4,000 buses that use CNG.

A jittery Delhi state administration April 7 ordered vacations in the schools to avoid traffic chaos on the New Delhi streets.

Currently, nearly 50,000 vehicles, including buses, taxis, and auto-rickshaws, run on CNG. The court had ordered the CNG fuel for public transport vehicles to clean the air in Delhi, considered to be one of the most polluted cities in the world. Bus operators say that the amount of CNG available in the Indian capital is inadequate and that conversion of diesel buses to CNG is far too expensive for them.

V. CNG Diverted to Private Firms

The bench directed the federal government to give priority to the transport sector in Delhi and other cities in supplying CNG rather than allotting it to private industries.

"There has been a desire to benefit the private sector at the cost of public health," the court said. "The supply of CNG in the city is adequate, but it is being diverted to private industries."

India's Supreme Court has been spearheading a drive to curb pollution in Delhi, rated one of the world's most polluted cities. In December 2000, the Supreme Court closed hundreds of smoke-belching factories operating out of residential areas.

The court directed the Delhi state administration to convert 800 diesel buses to CNG mode each month.□

45. China Invests In Electric Cars To Combat Pollution

China plans to invest 880 million yuan (\$106 million) to develop electric vehicles to combat air pollution, according to state media. Domestic companies would be funded by the government over the next few years to develop vehicles that run on electricity or other power sources, the China Daily newspaper said.

"Developing electric vehicles is significant in the effort to save oil energy, minimize air pollution, and to give an impetus to the development of the country's auto industry," it quoted Ministry of Science and Technology official Li Jian as saying.

Car emissions are a major source of serious air pollution in many Chinese cities.

Electric vehicles would be used for transport services when the capital Beijing hosts the Olympics in 2008, Li was quoted as saying.

The Beijing city government has promised to spend billions of yuan on cleaning up the environment and to move dirty factories away from the city center in time for the Olympics.

Electric powered vehicles might also reduce heavy reliance on crude oil imports, the paper said.

China has been a net oil importer since 1993 due to growing demands for energy in the fast developing country.

46. Sanyo, Honda To Develop

Hybrid Car Batteries

Japanese electronics maker Sanyo Electric Co said it would jointly develop batteries with Honda Motor Co Ltd for hybrid cars powered by a petrol engine and an electric motor. Sanyo, a leading battery supplier for electronic products, said the two firms would develop a nickel hydrogen battery to meet the specific needs of different vehicles.

Japan's hybrid car market is still in its infancy with 50,400 units sold as of March 2001, according to the Japan Electric Vehicle Association. But the industry group said the number is expected to have grown to 73,000-74,000 by March this year.

Japan's hybrid car battery market is currently dominated by Matsushita Electric Co Ltd. Sanyo said it would aim for annual sales of 50 billion yen (\$380.5 million) and to capture 50 percent of the global hybrid car battery market by 2005.

Honda has already rolled out two hybrid car models, using nickel hydrogen batteries supplied by Matsushita Electric.

GENERAL

47. Climate Change Depleting Southern Ocean Oxygen

The Southern Ocean, which swirls

around the Antarctic and is a key to the health of oceans around the world, is being slowly starved of oxygen, Australian scientists have found. Research expeditions are showing declining oxygen content in the ocean at depths of 500 to 1,500 meters, Australia's state-backed Commonwealth Scientific and Industrial Research Organization (CSIRO) said.

"The Southern Ocean is considered by oceanographers as the 'lungs' of the world's oceans," the CSIRO said in a statement from Hobart, Tasmania. Limited work in the north Pacific also apparently showed declining oxygen content, consistent with model simulations.

CSIRO scientists are now collecting further samples south of Tasmania to widen the sample base. Samples so far have been taken from the sea on a line between Tasmania and Antarctica, with most readings from between 50 and 65 degrees latitude south. The readings are important for fine-tuning predictions of severe weather events, including floods and rising sea levels. In the much longer term they have importance for the entire life of the seas.