The Economist

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# Cool it

## Cleaning up the old act

IN TWO decades the industrial countries have made extraordinary progress in curbing energy-related pollution from conventional fuels, using a variety of policies. For instance, leaded petrol has been phased down or out by bans (eg, in Canada), by differential taxes (eg, in Japan, and more recently several European countries) and, in the case of the United States, by an ingenious trading arrangement that set refineries a time limit for phasing out lead. Those that beat the timetable were allowed to sell their quota to those that were slower.

In the 1970s the OECD countries began serious efforts to cut sulphur dioxide and, more timidly, nitrogen oxides from factory and power-station chimneys. Japan and America led the way in the early 1970s: the Europeans straggled after them in the 1980s. Japan's power plants cut their output of sulphur dioxide from almost seven grams a kilowatt-hour in 1970 to less than one gram by 1980. America's Clean Air Act was passed in 1970, setting deadlines for reaching air-quality standards. Although they were frequently waived, sulphur-dioxide output fell while the amount of coal burnt increased. Germany, having dawdled through the 1970s, suddenly noticed in 1980-81 that its forests were dying; it imposed limits for sulphur dioxide and nitrogen oxides so tough that only the most modern wet scrubbers (for SO2) and selective catalysts (for NOX) could meet them. Under the United Nations Economic Commission for Europe convention on Long-Range Transboundary Air Pollution, signed in 1985, 21 countries promised to cut sulphur dioxide to at least 30% below 1980 levels by 1993. The EC states agreed on their own targets in the Large Combustion Plants directive, passed in 1988. This set different targets for different countries. That reflected mainly political muscle, but some sound economics: for some countries, the costs of success will be higher than for others.

With stationary sources of pollution, so with transport: Japan and America acted well before Europe, but once Europe began to move, Germany took the lead. America's 1970 Clean Air Act set standards which forced the development of catalytic converters. These have since been progressively tightened, most of all in California, home to nearly 2% of the world's cars. Japan's tailpipe standards match America's. The EC countries, pressed by Germany, Holland and Denmark, moved into line with America in 1989 only after a tremendous battle -- and only to find that revisions to the Clean Air Act in 1990 brought another upward twist to America's own standards. California, typically, went one further: last year the state announced targets for sales of "low-emission" and "ultra-low emission" vehicles. By 1998 2% of car sales, and by 2003 10%,

must be of "zero-emission" vehicles, which in effect means electric power (conveniently ignoring the emissions from the generators).

For new plants it will generally be much cheaper to comply with high standards, building in controls from the beginning, than for old ones, which may have to be retrofitted. The temptation for regulators is therefore to be more lenient to old plants than to new ones, especially if (as so often happens) the old plants are in places where industry is dying and the new ones are in boom towns. But building in new pollution-control technology, even right from the start, will raise the cost of a new investment. It may also, as with flue-gas desulphurisation (FGD, or scrubbers) equipment, raise the running costs. So, where companies have a choice, they may coax more output from their old, dirty plants, rather than undertake new investment which will have to meet high standards.

A similar problem exists with cars. Tougher standards affect only new cars; the rest of the fleet is untouched. But together standards also make new cars dearer, relative to the rest of the fleet. People may therefore simply keep their old bangers longer.

How to make standards more cost-effective? America has an idea which may provide an answer. Using concepts developed in the 1960s and reworked by Project 88, a public-policy study led by two senators, Timothy Wirth and John Heinz, and by the **Environmental Defence Fund, America's most economically literate green campaigners**, the 1990 overhaul of the Clean Air Act built in a mechanism to swing the force of the market behind reductions in acid rain. The act sets a limit, which will be gradually reduced, on the amounts of SO2 and NOX that can be emitted by power stations and other big polluters. Quotas for the gases are being shared out among polluters, who will then be encouraged to trade them, so that a polluter who finds it relatively cheap to beat the limit will be able to sell spare "credits" to other polluters who find it more expensive.

This scheme will be watched with intense interest by regulators and environmentalists in other countries. An earlier permit-trading scheme, under the old Clean Air Act, was not a success: adopted as a way to cope with non-compliance, it was repeatedly thwarted in court by enraged environmentalists. Some trading took place within individual firms; practically none between firms. Sceptics worry about two problems. First, as Doug Bohi of Resources for the Future, a Washington-based public-policy group, points out, American electricity utilities are highly regulated regional monopolies. They may not be the best guinea pigs for a system that assumes they will behave like profit-maximising companies. Secondly, the system will need a new approach from state utility regulators. If they set the rules for cost recovery in such a way that utilities always find it cheaper to clean up than to buy credits, the scheme will be a failure.

**Taking to the road**

With state-of-the-art technology, and at a price, it is now possible to remove over 95% of the sulphur dioxide from the flue gases of even a coal-fitted station, 99% of the ash and over 90% of the nitrogen oxides. But as power stations are driven to ever greater (and more expensive) targets by their regulators, some notice a conflict between their achievements and those of the cars that drive past their doors.

Leaving aside the intransigent problem of carbon dioxide, the pollutants which proved hardest to reduce are nitrogen oxides and volatile organic compounds: the two main components of smog. NOX is produced both by fossil-fuel burning power stations and by cars; indeed, road vehicles account for more than half the total. In smoggy southern California, where NOX regulations have been gradually tightening for 30 years, Southern California Edison (SCE), the largest electricity utility, has been told to reduce its NOX output still further. By various ingenious devices, and at a cost of $ 700m, it can squeeze its NOX down by a further 86% by 1997. Big deal: its NOX is a fragment of the region's total. Would it not be more sensible, SCE asked the regulators, for the utility to go to local small companies and reduce their NOX output, removing far more gas at a far lower cost?

When SCE recently contemplated a merger with a San Diego utility, a rearrangement of generating capacity would have meant a slight increase in SCE's output of NOX. On that occasion, SCE was allowed by the local air-quality regulator to offer incentive payments to local businesses and water companies to convert their NOX-belching internal-combustion engines into electric plant. The merger failed, but SCE spent the money and saw the arguments for a market-based approach that would allow such trades. The South Coast Air Quality Management District is busily studying those ideas. It has been considering ways in which cuts in the region's NOX emissions from cars might be traded against increases from stationary sources. SCE's electricity customers might wonder why they should end up paying for others to drive cleaner cars. For SCE itself, working on designs for electric vehicles, the scope for trading could become valuable later this decade.

One oil company, Unocal, voluntarily showed what might be done. Last year the company offered to buy pre-1971 cars for $ 700 apiece. It scrapped 8,400 polluting old jalopies, at a cost of $ 6m. "In two and a half months we did as much to improve air quality in the Los Angeles basin as $ 150m of spending over three to four years to clean up and retrofit our refineries. For that $ 150m," points out its chief executive, Richard Stegemeier, "we could do two of these programmes a year for ever."

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**SECTION:** Energy and the environment; SURVEY Pg. 6 (U.K. Edition Pg. SURVEY 6)

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**HIGHLIGHT:** Ingenious technology and conservation can curb the harm done to the environment by energy use. Both will best be encouraged by wise pricing policies, argues Frances Cairncross, our environment editor; New kinds of policies are needed to encourage the use of conventional fuels in cleaner ways

**GRAPHIC:** Picture, London's fog cleared